FINAL
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ENVIRONMENTAL ASSESSMENT FOR THE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN FOR EDWARDS AIR FORCE BASE, CALIFORNIA

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AIR FORCE FLIGHT TEST CENTER
ENVIRONMENTAL MANAGEMENT
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for Edwards Air Force Base, California
AF Form 813 #00-376

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Prepared by

Computer Sciences Corporation
FLIGHT TEST SUPPORT CENTER

COVER SHEET

ENVIRONMENTAL ASSESSMENT FOR THE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN FOR EDWARDS AIR FORCE BASE, CALIFORNIA

- Lead Agency: U.S. Air Force
- Cooperating Agency: None
- Proposed Action: Environmental Assessment for the Integrated Natural Resources Management Plan for Edwards Air Force Base, California
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- Designation: Final Environmental Assessment (EA*)*
- Abstract: Pursuant to the *National Environmental Policy Act of 1969*, this EA has been prepared in order to analyze the potential environmental consequences of the proposed action. The proposed project would involve management of the natural resources on Edwards Air Force Base through the implementation of a targeted Integrated Natural Resources Management Plan (INRMP). Adherence to all applicable Federal, State, and local laws and regulations, and Air Force Instructions would ensure no significant environmental impacts would occur as a result of this project.

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LIST OF ABBREVIATIONS AND ACRONYMS

412 TW/LGQ	Quality Assurance Inspection Branch
AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
ADCA	Animal Damage Control Act
AF	Air Force
AFB	Air Force Base
AFFTC	Air Force Flight Test Center
AFFTCI	Air Force Flight Test Center Instruction
AFI	Air Force Instruction
AFJMAN	Air Force Joint Manual
AFOSH	Air Force Occupational Safety and Health
AFPD	Air Force Policy Directive
AFRL	Air Force Research Laboratory
AGE	Aerospace Ground Equipment
ARPA	Archaeological Resources Protection Act
ATC	authority to construct
AVAPCD	Antelope Valley Air Pollution Control District
BASH	Bird Aircraft Strike Hazard
BEPA	Bald Eagle Protection Act
BHPO	Base Historic Preservation Officer
BLM	Bureau of Land Management
BMP	Best Management Practice
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
Cal-OSHA	California Occupational Safety and Health Administration
CAR	Combat Arms Range
CARB	California Air Resources Board
CATEX	categorical exclusion
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CNPS	California Native Plant Society
CO	carbon monoxide
dB	decibel
dBA	decibel, A-weighted
DNL	day-night average sound level

DoD	Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
DOT	Department of Transportation
DRU	Direct Reporting Unit
EA	Environmental Assessment
EIR	economic impact region
EIS	Environmental Impact Statement
EO	Executive Order
EPCRA	Emergency Planning and Community Right-to-Know Act
ESA	Endangered Species Act
FFCA	Federal Facility Compliance Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FOA	Field Operating Agencies
FOD	foreign object damage
FONSI	Finding of No Significant Impact
FS	Forest Service
FWCA	Fish and Wildlife Coordination Act
GIS	Geographic Information System
HAP	Hazardous Air Pollutant
HDSC	Hazardous Materials Distribution Support Centers
HMTA	Hazardous Materials Transportation Act
HWMP	Hazardous Waste Management Plan
INRMP	Integrated Natural Resources Management Plan
IPM	Integrated Pest Management
IRP	Installation Restoration Program
KCAPCD	Kern County Air Pollution Control District
MACT	maximum achievable control technology
MBTA	Migratory Bird Treaty Act
MDAQMD	Mojave Desert Air Quality Management District
MFH	Military Family Housing
MOU	Memorandum of Understanding
MSL	mean sea level
MWR	Morale, Welfare, and Recreation
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NESHAP	National Emission Standard for Hazardous Air Pollutants
NGR	National Guard Regulation
NHPA	National Historic Preservation Act

NO_x	oxides of nitrogen
NPS	National Park Service
NRCS	Natural Resource Conservation Service
O_3	ozone
ORV	off-road vehicle
OSHA	Occupational Safety and Health Administration
PIRA	Precision Impact Range Area
PL	Public Law
PM10	particulate matter equal to or less than 10 microns
PTO	permit to construct
RCRA	Resource Conservation and Recovery Act
SB	Senate Bill
SCS	Soil Conservation Service
SEA	Significant Ecological Area
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_x	sulfur oxides
SPRP	Spill Prevention and Response Plan
TIM	Technical Information Memorandum
TSCA	Toxic Spills Control Act
USACOE	United States Army Corps of Engineers
USAF	United States Air Force
USC	United States Code
USDA	United States Department of Agriculture
US EPA	United State Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UXO	unexploded ordnance
VOC	volatile organic compounds

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1.0 INTRODUCTION

1.1 Purpose and Need

The Commander of Edwards Air Force Base (AFB), in coordination with the United States Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG), proposes to manage the natural resources on Edwards AFB by developing and implementing an Integrated Natural Resources Management Plan (INRMP). The INRMP will comply with environmental laws, regulations, and policies, including the *Sikes Act* (16 United States Code [USC] 670a et seq.); Department of Defense Instruction (DoDI) 4715.3, *Environmental Conservation Program*; and Air Force Instruction (AFI) 32-7064, *Integrated Natural Resources Management*. The INRMP will support the military mission, conserve and protect the Base's natural resources; and build upon relationships established with Federal, State, and local agencies, nonprofit organizations, and the general public. The INRMP will also be consistent with other installation plans, specifically the new *Edwards AFB General Plan* (Air Force Flight Test Center [AFFTC] 2001).

The INRMP will emphasize a continued ecosystem management approach by Edwards AFB in concert with the Air Force mission. One goal of an ecosystem management approach is to protect the properties and functions of natural ecosystems. Since these ecosystems extend beyond the installation's boundaries, the Air Force's natural resources management will also include coordination and partnerships with agencies that have natural resources in the surrounding areas, achieving a balance between resource users, developing mechanisms to establish and maintain partnerships, and establishing an enhanced environmental education program. The proposed action has the following characteristics:

- Ecological Approach – The INRMP will continue to shift focus from protection of individual species to management of ecosystems.
- Partnerships – The INRMP will document partnerships to achieve shared goals. Ecosystems extend across political boundaries, making the need for cooperation, coordination, and partnerships essential for their management.
- Participation – The INRMP will include public involvement and communication, and will incorporate the public's needs and desires into management decisions.
- Information – The INRMP will use the best available scientific and field-tested information available in the decision-making process and select the most appropriate technologies for management of natural resources.
- Adaptive Management – Resource managers will incrementally implement adaptive management techniques as they become known through the dynamic process of applying the best available commercial and scientific data.

The major issues related to natural resource management activities identified for Edwards AFB include soils, vegetation, wildlife, and habitat. These resource areas were identified because they best encompass the natural resources on the Base that will be managed via the INRMP.

1.2 Location and Scope of the Proposed Action

Edwards AFB is located in the Antelope Valley region of the western Mojave Desert in Southern California. It is about 60 miles northeast of Los Angeles, California. The Base occupies an area of approximately 301,000 acres or 470 square miles. Portions of the Base lie within Kern, Los Angeles, and San Bernardino counties (Figure 1). Proposed project activities would be located throughout the Base.

1.3 Issues and Concerns

1.3.1 Issues and Concerns Studied in Detail

During the scoping process, the following issues and concerns were identified as requiring assessment when considering the potential environmental impacts of the alternatives. They are considered the primary issues of concern.

a. Land Use – Ecosystem management must consider both local and regional plans to ensure cooperation and to increase the potential for success.

b. Air Quality – Natural resource management activities may cause short-term degradation in air quality. Equipment and vehicles may generate criteria pollutants during restoration and exotic pest removal activities.

c. Safety and Occupational Health – Equipment and vehicles may produce increased noise levels, and toxic substances may be used for pest and weed control.

d. Hazardous Materials and Waste – A limited increase in pesticide and herbicide use is anticipated due to increased active management of exotic species.

e. Biological Resources – Ground-disturbing activities associated with natural resource management practices and equipment have the potential to disturb wildlife and vegetation.

f. Cultural Resources – Ground-disturbing activities associated with natural resource management practices and equipment have the potential to disturb cultural resource sites.

g. Geology and Soils – Natural resource management activities have the potential to create soil erosion during exotic vegetation removal and to disturb soil during habitat restoration activities.

h. Socioeconomic – This activity may generate some revenue into the local economy.

i. Environmental Justice and Protection of Children – The Executive Orders on Environmental Justice and children require Federal agencies to identify and address disproportionately high adverse effects of its activities on minority and low-income populations and children.

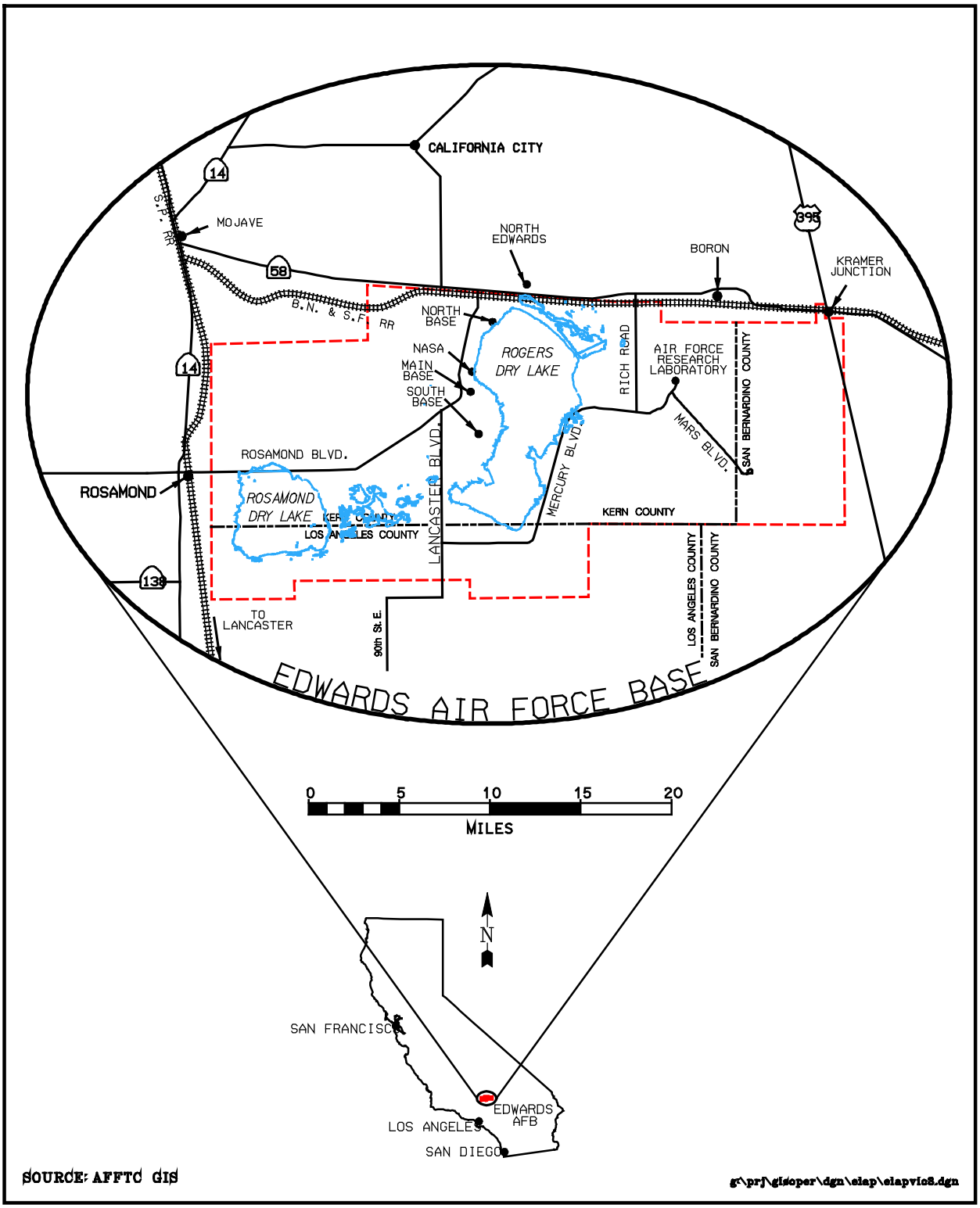

Figure 1 General Vicinity Map

1.3.2 Issues and Concerns Eliminated From Detailed Study

The following issues and concerns were initially considered, but subsequently eliminated from further consideration in this Environmental Assessment (EA) because no aspect of the proposed action affects these resources:

a. Airspace – No natural resource management activities would be expected to utilize airspace.

b. Infrastructure – No infrastructure changes are anticipated to support natural resource management activities.

c. Public/Emergency Services – No additional services would be needed to support proposed natural resource management activities.

d. Water Resources – Potable water is not used for natural resource management at Edwards AFB. Stormwater runoff and floodplains, sometimes considered water resource issues, are addressed under Land Use.

1.4 Regulatory Requirements, Permits, and Approvals

1.4.1 Regulatory Requirements

This EA has been prepared in order to comply with the *National Environmental Policy Act of 1969* (NEPA), and the Council on Environmental Quality (CEQ) regulations implementing NEPA (Sections 1500.1(b) et seq.). This document is intended to fulfill the requirements for compliance with Title 40 Code of Federal Regulations (CFR) Parts 1500-1508 and Air Force Instruction (AFI) 32-7061, *The Environmental Impact Analysis Process*.

1.4.2 Permits and Approvals

The proposed project will require permits and/or approvals from other Federal, State, and/or local agencies, or various Base offices depending upon the extent of the work proposed, type of equipment used, etc. The contractor performing the work is responsible for obtaining the relevant permits and accomplishing any required notification. Environmental permitting requirements for all work on Base are coordinated through Environmental Management. However, as permitting requirements change, others may be required. The following permits would be required:

a. A digging permit (Air Force [AF] Form 103) may be required for some revegetation and exotic weed removal activities.

b. A Section 7 Consultation with the USFWS may be required for some of the desert tortoise management activities.

c. Depredation permits from the USFWS are required for nongovernment civilians and Air Force contractors to disturb nesting migratory birds.

d. A Department of Defense (DoD) Applicator Certification is required to apply pesticides on Federal property.

e. Formal consultation with the Advisory Council on Historic Preservation (ACHP) and/or the California State Historic Preservation Office (SHPO) pursuant to Section 106 of the

National Historic Preservation Act (NHPA), as amended (16 USC 470 et seq.) may be required if natural resource management has the potential to impact protected sites.

1.5 Related Environmental Documents

A number of related environmental documents have been prepared and approved that address activities related to the INRMP. These documents contain information used in the preparation of this EA. A listing of these documents and other references can be found in Section 5.

1.6 Future Use of This Document

Future actions documented on an AF Form 813, *Request for Environmental Impacts Analysis*, would be reviewed and evaluated to determine if they fall within the scope of this EA. The activities covered in this analysis are by definition considered routine and reoccurring and would qualify for a categorical exclusion (CATEX). In the event that a future action is determined to fall within the scope of this EA and no new environmental impacts would occur as a result of the future action, a CATEX would be prepared once the AF Form 813 is submitted. A CATEX could also be prepared for future actions that would result in minor impacts not discussed in this EA, if impacts could be reduced to insignificant levels through minimization. In some cases, a supplement to this EA may be required. In this case, a new Finding of No Significant Impact (FONSI) would be required. Future actions that are found to result in significant impact to the environment that could not be minimized to a level of insignificance would need to be addressed in an Environmental Impact Statement (EIS).

1.7 Draft Environmental Assessment Public Notification Process

A scoping notice for the development and implementation of a revised and updated INRMP and the start of the NEPA process was published on the 8th and 9th of February in four local newspapers (see Appendix D for a copy of the display ad). Copies of the scoping notice were also mailed directly to various Federal, State, and local officials. A copy of the current INRMP was made available on the Internet and was also available in hardcopy on request. The scoping notice requested comments and any concerns from the general public on the INRMP. No comments were received during the 30-day review period.

This Draft EA is being made available for public comment with a 30-day public review period. The comment period is being publicized by paid public announcements in local newspapers, on the Internet, and copies are available for review in local libraries and to those individuals who request copies.

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2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The issue to be analyzed in this EA is how the natural resources at Edwards AFB should be managed. In 1995, the major Federal land management agencies signed a Memorandum of Understanding (MOU) to adopt ecosystem management. The Department of the Air Force is required by the *Sikes Act* and DoDI 4715.3, *Environmental Conservation Program*, to use ecosystem management principles on Air Force lands. Ecosystem management is not, however, a single concept with simple rules. There are many discretionary management techniques and practices within the realm of ecosystem management. It is more a philosophical approach than a detailed list of specific actions. For example, the Forest Service (FS), Bureau of Land Management (BLM), and National Park Service (NPS) also have an ecosystem management requirement, but they approach the specific details in very different manners.

The FS, BLM, and NPS all use ecosystem management principles to manage their lands. Their different missions direct their specific land management practices and their styles of ecosystem management. The FS uses a more active management style to support their mission requirement to produce timber for the nation. The BLM uses a passive management style, but allows consumptive use of natural resources. The NPS has a "hands off" approach that lets nature take its course with little or no interference from man. The approach or style of management to be used at Edwards AFB is the subject of the analysis in this EA.

The Commander of Edwards AFB, in coordination with the USFWS and the CDFG, proposes to manage the natural resources on Edwards AFB by developing and implementing an updated INRMP. This section describes alternative plans to meet this need. Alternative A – Targeted Management Plan, Alternative B – High Level Active Management Plan, and Alternative C – the No Action Alternative.

2.1 Alternative A – Targeted Management Plan (Proposed Action)

Under this alternative, an INRMP would be developed and implemented in an attempt to mimic the natural carrying capacity of natural resources with minimal interference from human activities. Under this alternative, most, but not all, resource areas would be managed at a relatively low intensity. Managing to mimic the carrying capacity would involve some new initiatives for natural resources (plants and animals – game and nongame). This alternative depends on effectiveness monitoring to guide the specific management practices through adaptive management practices.

This alternative is characterized by a systematic approach to restoring high priority areas, little to no increase in projected noise levels, a systematic program for the removal of high priority exotic species (primarily plant species), and control of soil erosion to prevent habitat loss. Some limited ground disturbance would be expected with these activities, along with limited pesticide and herbicide use for exotic species control. The various individual management plans required by AFI 32-7064 would be developed and integrated together.

2.2 Alternative B – High Level Active Management Plan

Under this alternative, an INRMP would be developed and implemented using commercial production techniques or active usage as a guideline. The INRMP would include different intensities of management specifically targeted to a particular resource category. Specific groups

of plants and animals would be targeted to increase standing wildlife and native plant populations. Techniques used as part of this alternative would include the establishment of food plots for targeted wildlife populations, artificial water sources, and harvesting plans. This alternative uses management practices to actively enhance the habitat and increase native plant and animal populations.

This alternative is characterized by more restoration projects and effective monitoring plots than Alternative A, some increased noise levels due to the increase in the number of projects in general, projects to remove most exotic species, the use of agricultural practices (i.e., wildlife food plots), reintroductions of native species to enhance wildlife populations, and more active use of stabilization techniques to control erosion. The various individual management plans required by AFI 32-7064 would be developed and integrated together.

2.3 Alternative C – Minimal Active Management Plan (No Action)

Under this alternative, no change in management direction or intensity would be proposed in the INRMP. Existing conditions and management practices presented in Section 3.0, Affected Environment, would continue and no new initiatives would be established. The No Action Alternative using existing plans represents a low level of active management and would not provide a fully integrated approach. Under the No Action Alternative, the Base's wildlife and habitat resources management would continue to be carried out at a relatively low intensity and soil erosion and restoration would be managed at a medium intensity. Under the No Action Alternative, Edwards AFB would continue to comply with all applicable Federal, State, and local laws and regulations; however, only minimal actions, as required by the various natural resources related policies and laws would be accomplished.

This alternative is characterized by compliance monitoring to conserve protected species, no systematic restoration of high priority areas, very limited control of exotic species, and control of erosion areas only when they become a problem. The various management plans required by AFI 32-7064 have been developed in an ad hoc manner and coordinated with the other plans through the NEPA review process.

2.4 Criteria for Selection of a Reasonable Range of Alternatives

The criteria identified in this section establish a minimum set of requirements that must be met in order for an alternative to be considered viable. The alternative that best meets all the criteria will be selected to fulfill the proposed action. The criteria used to select the alternatives discussed in this document are described below. Any aspect of an alternative plan that would exceed the criteria stated below would be considered as a potentially "significant impact" as defined by CEQ. They include:

a. Technical

   (1) AFI 32-7064, *Integrated Natural Resources Management*.

   (2) The alternative must have the capability to support and not interfere with the mission of the Air Force at Edwards AFB.

   (3) The goals and objectives should be technically feasible.

(4) Logistically effective.

(5) Compatible with the Base General Plan.

b. Environmental

(1) Retain maximum amount of undisturbed area.

(2) Minimize the extent of environmental impacts.

c. Economic

(1) Cost effective.

2.5 Alternatives Considered But Dismissed From Further Consideration

Plans can be developed with an almost infinite number of variations. The three alternatives selected for evaluation represent a low, medium, and high level of active ecosystem management. These alternatives were selected to meet the intent of NEPA to cover the full spectrum of feasible alternatives. The suite of proposed goals and objectives could be combined in many fashions; however, ecosystem management is more a philosophical approach than a detailed list of specific actions. All alternatives originally considered have been retained within the document. No alternatives were dismissed from further consideration.

2.6 Comparison Summary of Alternatives

Table 1 provides a descriptive comparison summary of the key features for Alternative A (Targeted Management Plan), Alternative B (High Level of Active Management Plan), and Alternative C (No Action Alternative).

The natural resource management techniques and activities discussed in this analysis are considered as a group of related actions. Most of the actions are directed specifically at desert tortoise protection and management of other protected species, however, the techniques and management activities also benefit other species. Management actions include compliance monitoring to insure no adverse impacts by mission projects occur, exclusion fencing, relocation of species out of areas considered dangerous, emergency relocation of individuals out of immediate harm areas (i.e., roads), data collection (location and time), veterinary care for injured individuals, population density estimates done in conjunction with the USFWS, enforcement of wildlife regulations and policies, and closure of hazardous sites (i.e., pitfalls) to prevent accidental mortalities of wildlife. All of these activities are integrated through the NEPA review procedures to insure consistency with other plans and policies as well as other functional areas (i.e., to prevent disturbance of cultural resource sites). The majority of the data collected is also integrated into the Base Geographic Information System (GIS), which serves as one of the primary integration tools.

TABLE 1
SUMMARY OF THE POTENTIAL ENVIRONMENTAL IMPACTS

ENVIRONMENTAL ISSUE	ALTERNATIVE A – TARGETED MANAGEMENT PLAN	ALTERNATIVE B – HIGH LEVEL OF ACTIVE MANAGEMENT PLAN	ALTERNATIVE C – NO ACTION ALTERNATIVE
LAND USE			
• Compatibility with Base General Plan and the Edwards Air Force Base (AFB) Design Standards	Yes – sensitive resource areas avoided, if possible.	Same as Alternative A.	Same as Alternative A.
• Creation of Foreign Object Damage (FOD)	Little – some ground-disturbing activities associated with restoration and exotic species removal.	More than Alternative A – more restoration and exotic species removal projects.	Almost none associated with limited natural resource management activities.
• Restoration projects	Systematic program of restoring high priority areas.	Systematic program to restore all disturbed areas.	Project specific restoration, typically directed by Biological Opinions.
• Grazing and agricultural practices allowed	No.	Yes.	No.
	Wildlife food plots – none.	Some plots for migratory bird use.	None.
• Wildfires (and man-induced fire)	Limited – isolated fires caused by natural sources (i.e., lightning) allowed to burn out naturally, all others are actively controlled and/or extinguished.	All are actively controlled and/or extinguished.	Limited – isolated fires caused by natural sources (i.e., lightning) allowed to burn out naturally, all others are actively controlled and extinguished.
NOISE			
• Number and types of noise sensitive receptors	Limited noise associated with weed removal activities and outdoor recreation activities.	More weed removal projects and associated noise events and a higher level of outdoor recreation allowed.	Almost none associated with limited natural resource management activities.

TABLE 1 (CONTINUED)
SUMMARY OF THE POTENTIAL ENVIRONMENTAL IMPACTS

ENVIRONMENTAL ISSUE	ALTERNATIVE A – TARGETED MANAGEMENT PLAN	ALTERNATIVE B – HIGH LEVEL OF ACTIVE MANAGEMENT PLAN	ALTERNATIVE C – NO ACTION ALTERNATIVE
AIR QUALITY			
• Tons and types of pollutants generated (vehicle and equipment use, pesticides, herbicides, ground disturbances)	Less than 1 ton of oxides of nitrogen (NO_x) and volatile organic compounds (VOC), or particulate matter less than or equal to 10 microns (PM10) would be expected on an annual basis.	More than Alternative A, but still less than 1 ton of NO_x and VOC, or PM10 would be expected on an annual basis.	Current pollutants associated with natural resource management are primarily limited to vehicle use and produce well below 1 ton of pollutants annually.
• Regionally significant	No.	No.	No.
• Permits required	No.	No.	No.
SAFETY AND OCCUPATIONAL HEALTH			
• Potential for exposure to herbicides and pesticides	All herbicides and pesticides are applied by contractors under the supervision of a Department of Defense (DoD)-certified applicator.	Same as Alternative A.	Same as Alternative A.
HAZARDOUS MATERIALS AND WASTE			
• Type and amount of hazardous materials used	Small quantities of herbicides and pesticides would be used under this alternative (estimated at less than 25 gallons/year), Integrated Pest Management (IPM) emphasizes the use of nonchemical removal.	Small quantities of herbicides and pesticides would be used under this alternative (estimated at less than 100 gallons/year).	Limited use – mostly in developed areas.

TABLE 1 (CONTINUED)
SUMMARY OF THE POTENTIAL ENVIRONMENTAL IMPACTS

ENVIRONMENTAL ISSUE	ALTERNATIVE A – TARGETED MANAGEMENT PLAN	ALTERNATIVE B – HIGH LEVEL OF ACTIVE MANAGEMENT PLAN	ALTERNATIVE C – NO ACTION ALTERNATIVE
HAZARDOUS MATERIALS AND WASTE (Concluded)			
• Type and amount of hazardous waste generated	No hazardous wastes are expected to be generated. All mixing and equipment cleanup are done off Base by contractors.	Same as Alternative A.	Same as Alternative A.
• Handling/Storage/Disposal Requirements	All herbicides and pesticides are applied by contractors under the supervision of a DoD-certified applicator.	Same as Alternative A.	Same as Alternative A.
BIOLOGICAL RESOURCES			
▪ Probability of take of an endangered/threatened species	Not likely, but possible.	Not likely, more possibilities due to increased number of projects and project sites.	Not likely based on history.
• Exotic species control (includes native species that are considered pests)	Systematic program of targeting invasive species using directed back-pack spraying, hack and squirt technique, baits for animals, etc., with pesticides that are biodegradable and do not migrate. Targeting also includes pesticides that are specific, seasonal application to avoid non-target species.	Target all exotic species using the same techniques as Alternative A.	Prevent spread and control in severe problem areas.
• Wildlife management	Guzzlers – maintain current sites, redesign for self-filling and to prevent exotic species usage.	Expand number and areas with Guzzlers.	Maintain current sites that require artificial filling.

TABLE 1 (CONTINUED)
SUMMARY OF THE POTENTIAL ENVIRONMENTAL IMPACTS

ENVIRONMENTAL ISSUE	ALTERNATIVE A – TARGETED MANAGEMENT PLAN	ALTERNATIVE B – HIGH LEVEL OF ACTIVE MANAGEMENT PLAN	ALTERNATIVE C – NO ACTION ALTERNATIVE
BIOLOGICAL RESOURCES (Concluded)			
• Recreation	Allow limited passive use (hiking, biking, and wildlife watching) and limited hunting and stocking for fishing.	Promote increased passive use and increase areas and accessibility to hunting and more stocking for fishing.	Limited passive use (hiking, biking, and wildlife watching) and limited hunting and fishing.
• Monitoring	Effectiveness monitoring (60 plots Basewide) and project compliance monitoring. Encourage population growth through habitat protection and specific habitat restoration and management projects. Effectiveness monitoring, limited sample size.	Effectiveness monitoring, more sites than in Alternative A and project compliance monitoring. Encourage population growth through habitat protection and general habitat restoration projects Basewide. Effectiveness monitoring, larger sample size.	Protect through project compliance monitoring and complete basic surveys. Compliance monitoring only.
• Reintroductions of native species	None.	Considered.	None.
• Biodiversity	Use the best available data to replicate the natural biodiversity of the western Mojave Desert	Similar to Alternative A with more active management practices (i.e., re-introduction of native species).	Protect existing biodiversity through project-specific compliance monitoring and avoidance.
CULTURAL RESOURCES			
• Presence of sites within the Area of Potential Effect (APE)	Yes.	Yes.	Yes.
• Eligible or potentially eligible sites for listing on the National Register	Yes.	Yes.	Yes.
• Ability to avoid sites	Yes.	Yes.	Yes.

TABLE 1 (CONCLUDED)
SUMMARY OF THE POTENTIAL ENVIRONMENTAL IMPACTS

ENVIRONMENTAL ISSUE	ALTERNATIVE A – TARGETED MANAGEMENT PLAN	ALTERNATIVE B – HIGH LEVEL OF ACTIVE MANAGEMENT PLAN	ALTERNATIVE C – NO ACTION ALTERNATIVE
GEOLOGY AND SOILS			
• Extent of ground disturbance	Limited ground disturbance related to restoration and invasive weed removal.	More ground disturbance related to restoration and exotic weed removal than Alternative A.	Currently limited restoration projects as required by Section 7 Consultation, and most weed removal is in the developed parts of the Base.
• Duration of ground-disturbing activities (timeframe)	Temporary disturbances, typically one growing season.	Same as Alternative A.	Same as Alternative A.
• Soil erosion	Systematic repair of identified sites.	Same as Alternative A.	Repair of identified severe problem areas.
SOCIOECONOMIC			
• Contract support	Some of the resource specific projects would be expected to be contracted to private contractors.	Similar to Alternative A.	Currently most projects have been limited to basic surveys and limited restoration activities.
• Labor/supplies	Some landscape supplies, as well as, some herbicides and pesticides would be expected to be purchased locally.	Similar to Alternative A, with more projects and required supplies.	The supplies for these projects were purchased locally.

3.0 AFFECTED ENVIRONMENT

This section describes the relevant resources at Edwards AFB which may impact or which may be impacted by any of the action alternatives if they were implemented. This section establishes the baseline against which the decision maker and the public can compare the effects of all action alternatives. The following environmental attributes comprise the existing environment: Land Use, Air Quality, Safety and Occupational Health, Hazardous Materials and Waste, Biological Resources, Cultural Resources, Geology and Soils, Socioeconomics, and Environmental Justice and Protection of Children.

3.1 Land Use

Land may be used for a variety of purposes including residential, industrial, commercial, agricultural, recreational, and military. Specialized land uses may include radio transmission areas, bombing/missile ranges, wildlife enhancement areas, explosive ordnance ranges, and airfields. The *Edwards Air Force Base Comprehensive Plan* (AFFTC 1994) lays out long-range development at Edwards AFB. This Plan is being updated and replaced by the *Base General Plan*. This plan establishes the goals, policies, plans, and anticipated actions regarding the physical, social, and economic environment.

3.1.1 Regulatory Requirements/Guidance

The *Federal Land Policy and Management Act of 1976* (43 USC 1701 et seq.) establishes Congressional policy relating to the use and management of public lands.

Air Force Instruction 32-7062*, Air Force Comprehensive Planning*, contains the responsibilities and requirements for comprehensive planning and describes the procedures for developing, implementing, and maintaining the General Plan.

Air Force Joint Manual (AFJMAN) 24-306*, Manual for Wheeled Vehicle Driver* and Air Force Flight Test Center Instruction (AFFTCI) 10-2*, Control of Vehicles on the Airfield,* contain procedures, policies, and responsibilities for use of vehicles within the airfield on Edwards AFB.

3.1.2 On-Base Land Use

Edwards AFB consists of approximately 301,000 acres in Kern, Los Angeles, and San Bernardino Counties. The Base contains largely undeveloped or semi-improved land that is used to support the flight testing of a wide variety of military, civilian, experimental aircraft, and design and testing of rocket engines. The developed portion of the Base includes approximately 6 percent of the total Base area, and is concentrated on the west side of Rogers Dry Lake. The developed areas of the Base include Main Base, South Base, North Base, and the Air Force Research Laboratory (AFRL).

The *Edwards Air Force Base General Plan* establishes land use designations for the Base (Appendix A). Each category of land use is indicative of the predominate use of the facilities or land within that area and reflects the unique mission requirements and physical features, such as the dry lakebeds found at Edwards AFB. Within these various land use designations, specific areas have been set aside for a particular purpose. These include, but are not limited to the Off-

Road Vehicle (ORV) Areas I and II, hunting and fishing areas, and ranges (Figure 2).

3.1.2.1 Management Areas

Edwards AFB is a large installation that supports a diversity of resources and mission activities. In developing an overall natural resources management strategy for the installation, the Base property has been divided into smaller, more manageable units to facilitate oversight of activities and management of natural resources. These units are called Management Areas. In delineating Management Areas at Edwards AFB, consideration was given to the types of activities, both current and planned/proposed, as well as to the presence and condition of natural habitats and resources. Using this approach, the nine Natural Resources Management Units originally identified in the *Integrated Natural Resources Management Plan* (AFFTC 1997) have been consolidated into seven Management Areas (Figure 3). Management strategies have been identified for each Management Area that integrate mission and support uses (i.e., recreational uses) with natural resource conservation. Specific projects and activities that may be implemented in each Management Area to meet the management goals are delineated in the INRMP.

The seven management areas that are currently used at Edwards AFB include:

a. Aircraft Overflight Test Area – Management Area A;

b. Precision Impact Range Area (PIRA) – Management Area B;

c. Developed Areas – Management Area C;

d. Combat Arms Range (CAR) – Management Area D;

e. Dry Lakebeds, Flight Test/Runways – Management Area E;

f. Military Exercise/Test Area – Management Area F; and

g. AFRL – Management Area G.

3.1.2.2 Land Use Restrictions

Edwards AFB contains three areas that have special ecological concerns associated with them: desert tortoise critical habitat, mesquite woodlands, and Piute Ponds. Natural resource management occurs within these three areas. A discussion of biological resources associated with desert tortoise critical habitat, mesquite woodlands, and Piute Ponds can be found in Section 3.5, Biological Resources.

3.1.2.3 Visual and Aesthetic Resources

A Scenic Quality Map for Edwards AFB was created using BLM's Visual Resource Management Program and can be found in the *Edwards Air Force Base Comprehensive Plan* (AFFTC 1994). The Base was divided into subunits and rated according to the following factors: landform, vegetation, water, color, influence of adjacent scenery, scarcity, and cultural modification.

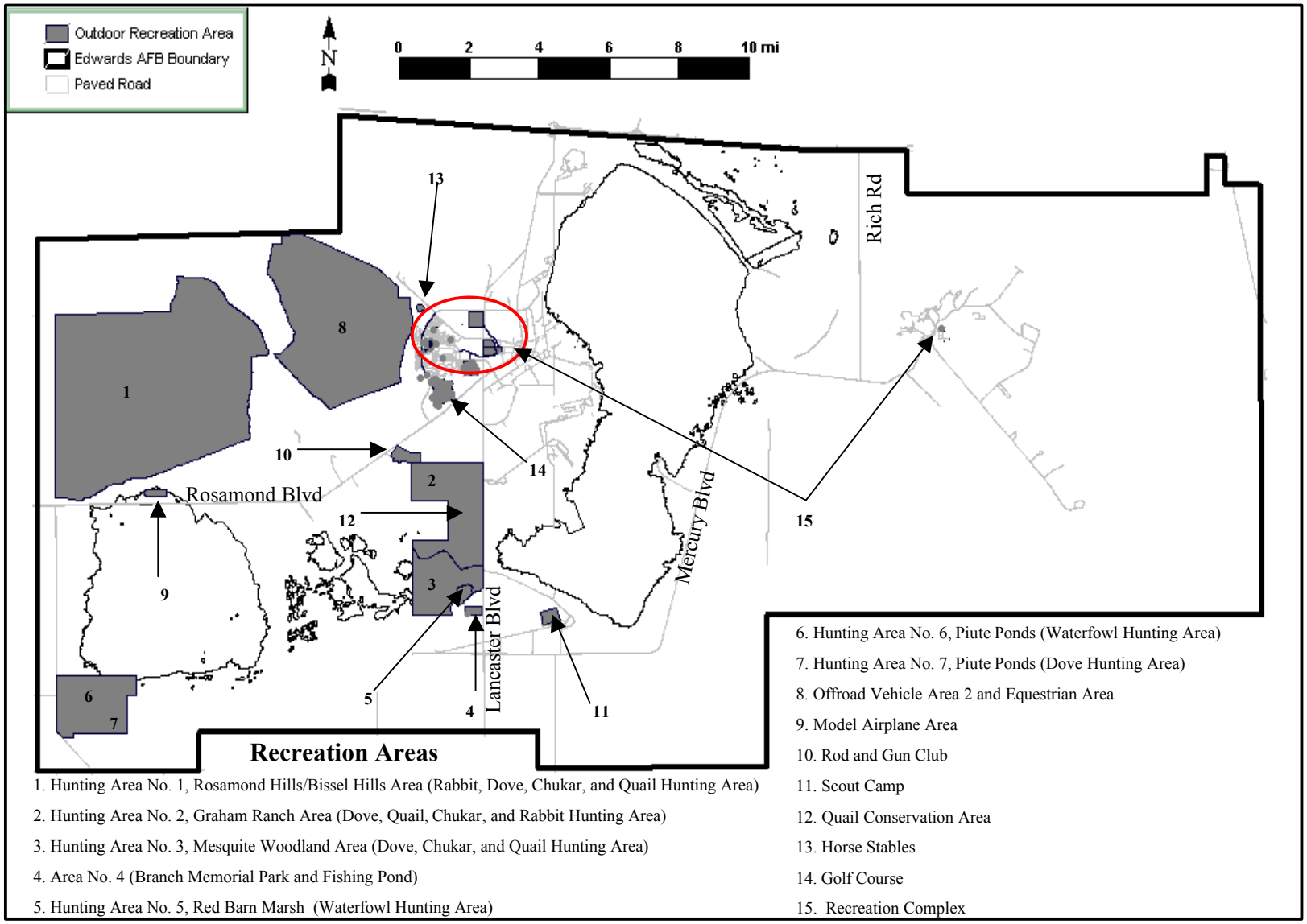


Figure 2 On-Base Land Use Areas

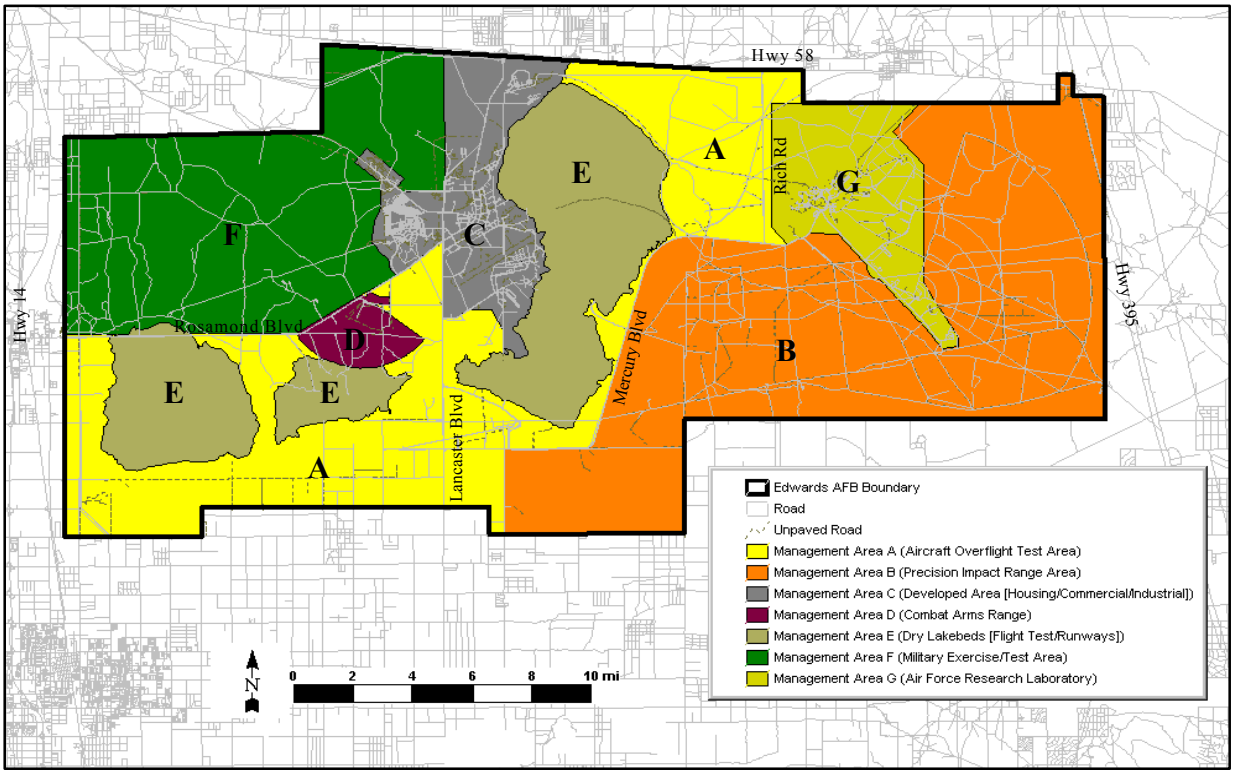


Figure 3 Management Areas Delineated on Edwards AFB

Class A areas combine the most outstanding characteristics of each rating factor. There are no Class A areas on Base. Class B areas combine some outstanding features and some that are fairly common to the physiographic region. These include areas such as the lakebeds, the more scenic and relatively undisturbed hills and ridges, the denser Joshua tree woodlands, and Leuhman Ridge. Class C areas contain features that are fairly common to the physiographic region and include the remainder of the Base, with the exception of the developed areas. Class D areas are so heavily developed/extensively disturbed that they lack positive aesthetic attributes and diminish the visual quality of surrounding areas. These areas include North Base, the former Jet Propulsion Laboratory, National Aeronautics and Space Administration (NASA), Main Base, South Base, housing, and the AFRL (AFFTC 1994).

The proposed project is located in all classification areas.

3.1.3 Airfield Operations

Use of the Edwards AFB airfield is limited to authorized personnel only, such as the Air Force, other government organizations, and contractors, to develop, test, and fly aircraft. Authorized government and private vehicles operate on the roads, taxiways, and runways. Pedestrian traffic occurs on the airfield with the heaviest concentration being in and around the hangars. The period of greatest use on the airfield occurs during weekdays.

The term foreign object damage (FOD) refers to damage, particularly to aircraft, which occurs as a result of collision with, or ingestion of, objects on or around runways, taxiways, and other areas of aircraft operations. The prevention of FOD is targeted specifically at flightline

areas and implementation procedures are contained in the AFFTC Supplement 1 to AFI 21-101, *Maintenance Management of Aircraft.* The Quality Assurance Inspection Branch (412 TW/LGQ) manages the reduction and/or elimination of FOD.

3.1.4 Noise (Annoyance)

Sound can vary simultaneously in level (or loudness) and frequency content (pitch), while also varying in time of occurrence and duration. The fundamental measure of sound levels is expressed in units of decibels (dB) using a logarithmic scale. Common sounds vary greatly in amplitude over a very large range. For instance, an aircraft flyover may produce a pressure amplitude a hundred times greater than a car driving by on a nearby street. On the logarithmic scale, these noise sources would differ by 40 dB.

Noise is generally defined as sound that is undesirable because it:

a. is intense enough to damage hearing,

b. interferes with speech communication and sleep, or

c. is annoying.

The Federal Interagency Committee on Urban Noise has developed land use compatibility guidelines for noise and provides recommended day-night average sound level (DNL) ranges for various land use categories based on this committee's findings. The DNL values of 65 dB and less, are generally compatible with all types of land uses. Residential, public, and some types of recreational land uses (e.g., outdoor music amphitheaters, nature reserves, etc.) are generally not considered compatible with yearly DNL ranges in excess of 65 dB. Commercial, industrial, and other types of recreational land uses (e.g., sports arenas, golf courses, amusement parks, etc.) are generally considered compatible with yearly DNL ranges between 70 and 75 dB, if measures are incorporated into the design and construction of structures associated with these land uses. Some transportation (i.e., railways, airports) and manufacturing land uses (i.e., mining, nonlivestock agriculture, fishing, and forestry) can tolerate yearly DNL ranges in excess of 85 dB.

A discussion of hazardous noise can be found in Section 3.3, Safety and Occupational Health.

3.2 Air Quality

Air quality in a given location is described by the concentration of various pollutants in the atmosphere. The type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing weather conditions determine air quality. The significance of the pollutant concentration is determined by comparing it to the Federal and State ambient air quality standards. These standards represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety.

3.2.1 Regulatory Requirements/Guidance

The 1970 *Federal Clean Air Act* (CAA) (42 USC 7401-7671 et seq.), and the 1990 *Clean Air Act Amendments* (CAAA), regulate air pollution emissions from stationary and mobile sources to protect public health and welfare. Air quality regulations were first promulgated with the CAA and revised with the CAAA. Stationary sources at Edwards AFB typically include fixed sources such as internal combustion engine generators, external combustion boilers, and spray paint booths. Mobile sources typically include motor vehicles, construction equipment, and aircraft.

3.2.2 National Ambient Air Quality Standards

The CAA and CAAA established the National Ambient Air Quality Standards (NAAQS) for the regulation of criteria pollutants. Criteria pollutants are chemical compounds that are known to have serious public health impacts, as well as cause damage to the environment in general. Designated State and local agencies have the primary authority and responsibility to implement rules and regulations to control sources of criteria pollutants. Within the State of California, the authority to regulate sources of air emissions resides with the California Air Resources Board (CARB) and is delegated to local air pollution control and air quality management districts. The criteria pollutants include ozone (O_3), carbon monoxide (CO), nitrogen oxides (NO_x), sulfur oxides (SO_x), and particulate matter equal to or less than 10 microns (PM10). In addition, volatile organic compounds (VOCs) and NO_x pollutants are classified as O_3 precursors, and are subject to further regulations.

Based on measured ambient criteria pollutant data, the United States Environmental Protection Agency (US EPA) designates all areas of the United States as having air quality better than (attainment) or worse than (nonattainment) the NAAQS. An area is often designated as unclassified when there are insufficient ambient criteria pollutant data for the US EPA to form a basis for attainment status. Once an area is classified as nonattainment, the degree of nonattainment is divided into categories of *Marginal*, *Moderate*, *Serious*, *Severe*, or *Extreme*. The assignment of a nonattainment category is based on measured criteria pollutant concentrations in a given location and varies according to the criteria pollutant of concern.

States are required to develop a State Implementation Plan (SIP) that sets forth how the CAAA provisions will be implemented within the State. The SIP is the primary means for the implementation, maintenance, and enforcement of the measures needed to attain and maintain the NAAQS within each State. The purpose of the SIP is twofold. First, it must provide a control strategy that will result in the attainment and maintenance of the NAAQS. Second, it must demonstrate that progress is being made in attaining the standards in each nonattainment area. The California O_3 SIP was approved by the US EPA in September 1996 and codified as law in 40 CFR 52, Subpart F (*Approval and Promulgation of Implementation Plans - California*).

Title III of the CAAA places more stringent restrictions on the allowable emissions of various types of hazardous and toxic substances into the air and requires that technology-based control measures be implemented to meet the stricter emission standards. The US EPA has set maximum achievable control technology (MACT) standards for only a few of the source categories of hazardous/toxic substances. Maximum achievable control technology standards for the remaining source types (i.e., *National Emission Standard for Hazardous Air Pollutants*

[NESHAP] rules on rocket and engine testing facilities, combustion engines, miscellaneous metal and plastic parts) will be promulgated 1 May 2001 (est. date) and will be published as final in the Federal Register Notice. After the standards are implemented, the US EPA may require facilities to perform residual risk analyses to determine human health impacts from residual toxic air emissions.

The *Air Toxics "Hot Spots" Information and Assessment Act of 1987* (Assembly Bill [AB] 2588) requires the inventory of emissions of approximately 500 chemical compounds not previously covered by the Federal CAA. Since the amendment of this statute in 1992 (Senate Bill [SB] 1731 Calderon), facilities that pose potentially significant health risks are required to reduce their risks. Owners of facilities found to pose significant risks by a district must prepare and implement a risk reduction audit and plan within 6 months.

3.2.3 Local District Control

Within the State of California, the authority to regulate sources of air emissions resides with the CARB and is delegated to local air pollution control and air quality management districts. Local districts enact rules and regulations to achieve SIP requirements. As shown in Figure 4, Edwards AFB is located within the jurisdiction of three local air districts: Kern County Air Pollution Control District (KCAPCD), Mojave Desert Air Quality Management District (MDAQMD), and Antelope Valley Air Pollution Control District (AVAPCD).

The nonattainment status of each of the three air districts is shown in Figure 5. The KCAPCD is designated as being in *Serious* O_3 nonattainment and in attainment or unclassified for all other pollutants. The MDAQMD is designated as being *Severe* O_3 nonattainment, *Moderate* PM10 nonattainment, and in attainment or unclassified for all other pollutants. The AVAPCD is designated as being *Severe* O_3 nonattainment and in attainment or unclassified for all other pollutants.[1]

In order to enforce these rules, the air districts have established baseline emission levels for new or modified stationary sources of PM10, SO_x, NO_x, and VOCs in nonattainment areas. Proposed projects that generate emissions in excess of these threshold levels would require offsets. These threshold emission levels are shown in Table 2.

[1] KCAPCD has jurisdiction over the eastern half of Kern County. All of Kern County is designated as *Serious* O_3 nonattainment. Parts of MDAQMD (exclusive of Edwards AFB) are unclassified for O_3 nonattainment. The AVAPCD has jurisdiction over northern Los Angeles County and is classified with regard to attainment status separately from the rest of Los Angeles County.

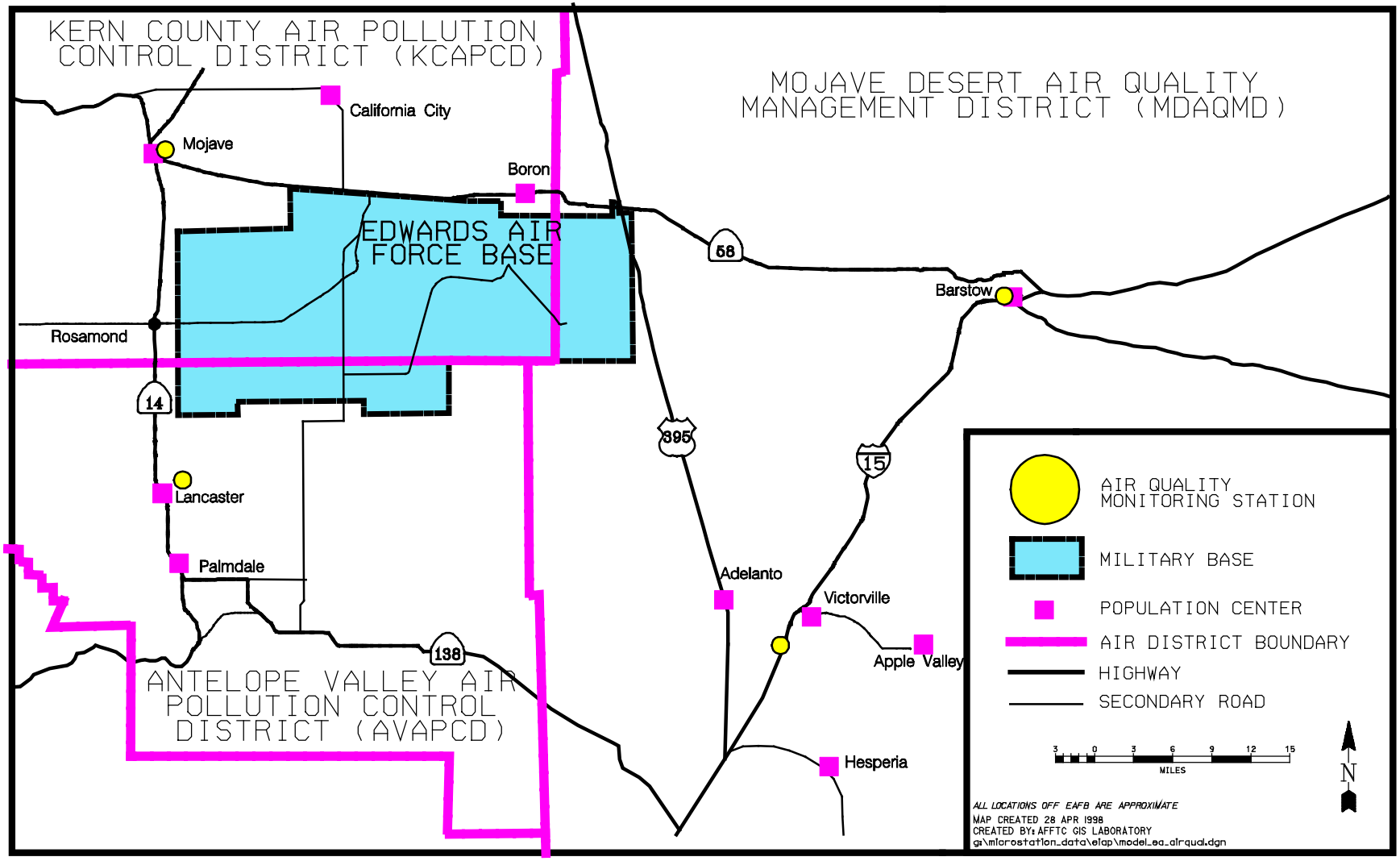
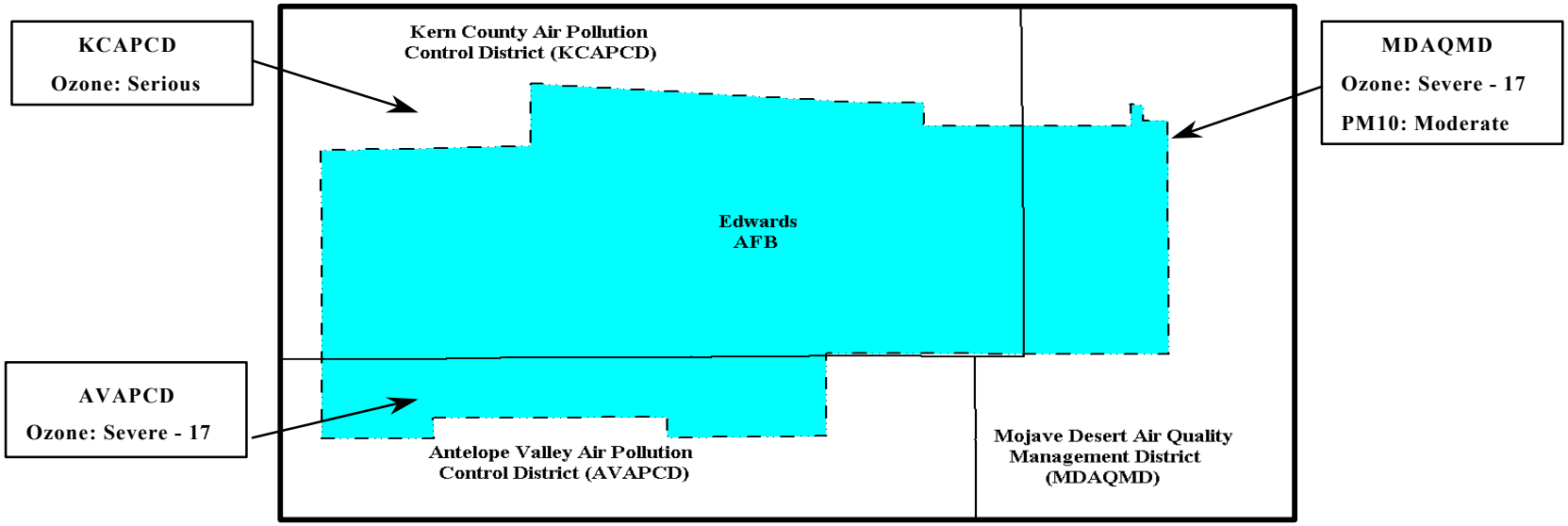


Figure 4 Air District Map

EDWARDS AFB
Current NAAQS Attainment Status



LEGEND

Severe - 17 = 25 ton limit per pollutant per action per year
Moderate = 100 ton limit per pollutant per action per year
Serious = 50 ton limit per pollutant per action per year
Unclassified = no established limit

SOURCE: 40 CFR 81.305

Figure 5 Attainment Status Map

TABLE 2
NEW SOURCE REVIEW THRESHOLD EMISSION LEVELS

	New Source Review Threshold Emission Levels per Pollutant (tons/year)			
Air District	**PM10**	**SO_x**	**VOC**	**NO_x**
KCAPCD	15	27	25	25
MDAQMD	15	25	25	25
AVAPCD	4	4	4	4

Source: Zellar 1999
Notes: 1. PM10 – particulate matter less than or equal to 10 microns
2. SO_x – sulfur oxides
3. VOC – volatile organic compounds
4. NO_x – oxides of nitrogen
5. KCAPCD – Kern County Air Pollution Control District
6. MDAQMD – Mojave Desert Air Quality Management District
7. AVAPCD – Antelope Valley Air Pollution Control District

To ensure compliance with all relevant Federal and State air laws, each district enacts their own rules and regulations. Local air districts use permits such as authority to construct (ATC) and permit to operate (PTO) as one method of implementing these rules and regulations.

Under the CAAA of 1990, Title V requires that major sources of air pollutants within each air district obtain a Federal operating permit. This permit is an all-encompassing permit, which includes all local air district permits (i.e., criteria pollutants and hazardous air pollutants [HAPs]) and documents compliance with other CAA regulations. Edwards AFB has filed Title V permit applications that are currently pending review and approval by the air districts. Compliance with local air district permits and other CAA regulations are required until such time as the permit is approved. Once issued, the Title V permit compliance would be an additional requirement.

3.2.4 Conformity Requirements

Federal facilities located in a NAAQS nonattainment area are required to comply with Federal Air Conformity rules and regulations of 40 CFR 51/93. Under Air Conformity, a facility (such as Edwards AFB) that initiates a new action (such as the proposed action) must quantify air emissions from stationary and mobile sources associated with that action. Calculated emissions are first compared to established *de minimis* emission levels (based on the nonattainment status for each applicable criteria pollutant in the area of concern) to determine the relevant compliance requirements. If the calculated emissions are equal to or greater than *de minimis* levels, then the requirements of air conformity apply to the action.

The proposed project is located throughout Edwards AFB. Thus, the NAAQS nonattainment and regional planning emission inventories for KCAPCD, MDAQMD, and AVAPCD would be used to determine the applicability of air conformity requirements to the proposed action.

In accordance with the air conformity requirements of 40 CFR 51.853/93.153 (b)(1) and KCAPCD Rule 210.7, the *de minimis* levels set for the O_3 *Serious* nonattainment area of KCAPCD for O_3 precursor emission is up to 50 tons per O_3 precursor pollutant (NO_x and VOC) per year per action.

In accordance with the air conformity requirements of 40 CFR 51.853/93.153 (b)(1) and MDAQMD Rule 2002, the *de minimis* level set for the O_3 *Severe* nonattainment area of MDAQMD for O_3 precursor emissions is up to 25 tons per O_3 precursor pollutant (NO_x and VOC) per year per action. In accordance with the air conformity requirements of 40 CFR 51.853/93.153 (b)(1) and MDAQMD Rule 2002, the *de minimis* level set for the PM10 *Moderate* nonattainment area of MDAQMD for PM10 emissions is up to 100 tons per year per action.

In accordance with air conformity requirements of 40 CFR 51.853/93.153 (b)(1) and AVAPCD Regulation XIII, the *de minimis* level set for the O_3 *Severe* nonattainment area of AVAPCD for O_3 precursor emissions is up to 25 tons per O_3 precursor pollutant (NO_x and VOC) per year per action.

In addition, even if calculated emissions are less than *de minimis* levels, a subsequent comparison must be made. Specifically, the calculated project emissions must be compared to the regional planning emission inventories for each applicable criteria pollutant in the nonattainment area of concern. If the calculated emissions are equal to or greater than 10 percent of the regional planning emission inventory, then the action is considered to be regionally significant and the requirements of air conformity apply. Otherwise, if the calculated emissions are less than both *de minimis* levels and 10 percent of the regional planning emissions inventories, then the requirements of air conformity do not apply to the action. Table 3 shows the 1990 baseline values and the 10-percent threshold values.

For KCAPCD, MDAQMD, and AVAPCD, the regional planning emission inventories for each district for O_3 precursor pollutant (NO_x and VOC) emissions are included in the 1994 California O_3 SIP. In the California O_3 SIP, the regional planning baseline year is 1990 for each of the three districts. For MDAQMD, the regional planning emission inventory for PM10 pollutant emissions are from the 1990 baseline year.

TABLE 3
1990 BASELINE AND 10-PERCENT THRESHOLD VALUES

	1990 Baseline Values (tons/year)			10-Percent Threshold (tons/year)		
District	**NO_x**	**VOC**	**PM10**	**NO_x**	**VOC**	**PM10**
AVAPCD	10,220	12,775	N/A	1,022	1,277.5	N/A
KCAPCD	14,965	6,205	N/A	1,496.5	620.5	N/A
MDAQMD	41,610	16,790	34,310	4,161	1,679	3,431

Source: Zellar 1999

Notes: 1. NO_x – oxides of nitrogen
2. VOC – volatile organic compound
3. PM10 – particulate matter less than or equal to 10 microns
4. AVAPCD – Antelope Valley Air Pollution Control District
5. KCAPCD – Kern County Air Pollution Control District
6. MDAQMD – Mojave Desert Air Quality Management District

3.3 Safety and Occupational Health

Health and safety is defined as the protection of workers and the public from hazards. The total accident spectrum encompasses not only injury to personnel, but also damage or destruction of property or products. For worker safety, the boundary of the immediate work area defines the region of influence. At Edwards AFB, the potential health and safety issues associated with implementing the proposed action would include noise and exposure hazards.

3.3.1 Regulatory Requirements/Guidance

The Occupational Safety and Health Administration (OSHA) has developed standards to promote a safe working environment. The standards establish general environmental controls, including personal protective equipment, wherever necessary because of hazards, processes, or the environment. Exposure limits for noise, ionizing and nonionizing radiation, and toxic and hazardous substances have been established, as well as requirements for handling and storing compressed gases and flammable liquids. The OSHA Act also provides standards for emergency response to releases of hazardous chemicals and hazardous wastes.

Federal OSHA requirements and AFIs are the applicable regulatory requirements. California OSHA (Cal-OSHA) regulations do not apply to Edwards AFB DoD workers (i.e., military and civilian). Independent contractors are responsible for meeting Cal-OSHA requirements. Statutory and regulatory requirements of the Federal OSHA and the Air Force Occupational Safety and Health (AFOSH) Standards, which apply to the safety of workers on Edwards AFB, are enforced locally by Bioenvironmental Engineering, Ground Safety, and the Base Fire Department. In addition, operational safety is supervised by various offices for specific activities.

The OSHA General Duty Clause, Section 5(a)1, states that employers will provide a workplace free of recognized hazards that cause or are likely to cause death or serious physical harm.

The *Resource Conservation and Recovery Act of 1976* (RCRA) (42 USC 6901) is administered by the US EPA. It regulates the handling, transport, storage, treatment, and disposal of solid and hazardous waste. It places responsibility for hazardous waste on facilities generating the waste and requires them to meet the various standards regarding personnel training, facility inspections, waste identification and analysis, emergency response planning, and recordkeeping.

Title 29 CFR 1910.95*, Occupational Noise Exposure*, states that protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in this Regulation.

Air Force Policy Directive (AFPD) 91-2*, Safety Programs*, states that the Air Force is committed to providing safe, healthful environments both for Air Force personnel and for those affected by Air Force operations. The Air Force must identify and control hazards to prevent mishaps. When mishaps do occur, the Air Force must learn the cause and take steps to ensure those mishaps are not repeated. This Directive establishes policies for the Air Force's approach to safety.

Air Force Instruction 32-1053*, Pest Management Program*, provides guidance for pest management programs at Air Force installations. It implements AFPD 32-10*, Installations and Facilities*, and DoDI 4150.7*, DoD Pest Management Program*.

Air Force Occupational Safety and Health Standard 48-19*, Hazardous Noise Program*, provides the criteria for the Air Force's minimum occupational health requirements. A program is established in this Standard to prevent possible harmful effects to personnel from exposure to hazardous noise. This Standard applies to all United States Air Force (USAF) organizations, including all USAF Reserve units and members. Major Commands, Field Operating Agencies (FOAs), and Direct Reporting Units (DRUs) supplement this Standard when additional or more stringent safety and health criteria are required as outlined in AFI 91-302, *Air Force Occupational and Environmental Safety, Fire Protection, and Health Standards (AFOSH)*. This Standard applies to all Air Force military and civilian personnel and to all sources of noise on Air Force facilities or under Air Force control. Contractor personnel are exempt from this Standard.

3.3.2 Exposure Hazards

Hazardous noise exposure occurs when workers are present in areas where ambient noise levels exceed 85 dB. To prevent potentially harmful effects to Air Force and civilian personnel from exposure to hazardous noise, the USAF established a hazardous noise program under AFOSH Standard 48-19, *Hazardous Noise Program*. Under this Program, Bioenvironmental Engineering is responsible for accomplishing hazardous noise surveillance to determine if military or DoD civilian personnel working in areas where hazardous noise exposure may occur, require engineering controls, administrative controls, or personal protection, or if potential hazardous noise areas require signage. Non-DoD civilian personnel working on the installation are exempt from AFOSH Standard 48-19, but must comply with applicable Federal and State regulations.

Hazardous noise areas exist in the Main Base, North Base and South Base Flightline, and AFRL test stand areas. As such, workers are required to follow AFOSH Standard 48-19*, Hazardous Noise Program*, and Federal OSHA. In addition, signs are posted to alert workers present in these areas.

Elements of the existing environment at Edwards AFB can present human health hazards. Specifically, personnel working outdoors may experience heat stress or hypothermia from exposure, be bitten by venomous snakes, contract hantavirus from exposure to rodents and/or their droppings, have limited exposure to pesticides and herbicides used for pest control, and contract valley fever from exposure to soils hosting spores.

An additional safety concern at Edwards AFB for any ground-disturbing activity is the presence of unexploded ordnance (UXO). Edwards AFB has a long history of use as a military installation and UXO items are occasionally found throughout the Base. A discussion of project generated noise and potential land use effects can be found in Section 3.1, Land Use. A discussion of the existing environment as it relates to pesticides/fungicides/herbicides, can be found in Section 3.4, Hazardous Materials and Hazardous Waste.

3.3.3 Safety

The statutory and regulatory requirements of the Federal OSHA and AFOSH standards that apply to the safety of DoD workers on Edwards AFB are enforced locally by Bioenvironmental

Engineering, AFFTC Safety, and the Base Fire Department. Operational safety is supervised by the Center Safety Office, which includes Flight, Ground, Test (Systems), Weapons, and Range Safety. The Proposed Action would include activities supervised by the following: Flight Safety, Ground Safety, and/or Range Safety Office(s). Safety management uses the AFPD 91-series (Safety Programs), other AFI 91-series, AFOSH standards, and applicable Federal, State, and Air Force guidance to implement the Base safety program.

Edwards AFB records bird airstrikes that occur along the flightline as well as other areas involving aircraft operations. Over a 10-year period from 1985 to 1995, approximately 128 bird airstrikes were recorded at Edwards AFB. Most of the birds involved in aircraft strikes along the main runways were identified as horned larks (*Eremophila alpestris*) (AFFTC 1995a).

Horned larks commonly occur in open habitat with sparse vegetation or areas of low shrubs (i.e., open field, agricultural areas, desert habitat, prairies, and grassland communities). The main runways on Base are surrounded by arid phase saltbush scrub. This plant community, combined with the open areas along the flightline, provides suitable habitat for horned larks. The vegetation adjacent to the runways is periodically graded, creating a buffer area devoid of vegetation, which also provides additional foraging habitat for horned larks. Methods that have been used at Edwards AFB to control the Bird Aircraft Strike Hazard (BASH) problem include revegetation with native plants and the use of a falconer.

The stormwater retention pond along the flightline attracts other types of birds (e.g., waterfowl, shorebirds, etc.) and possibly bats associated with aquatic habitats. Barn owls (*Tyto alba*) are known to inhabit buildings on the flightline. During the evening, owls feed on small rodents adjacent to the runways and in other areas nearby.

Air Force Instruction 91-202, *The US Air Force Mishap Prevention Program*, implements AFPD 91-2, *Safety Programs*. It also establishes mishap prevention program requirements, responsible organizations, and general information including the BASH Program. Edwards AFB has a BASH Plan in place. The AFFTC BASH Plan defines the BASH Program. The responsible organization for the Plan and its implementation is Flight Safety.

3.4 Hazardous Materials and Hazardous Waste

A hazardous material is any material whose physical, chemical, or biological characteristics, quantity, or concentration may cause or contribute to adverse effects in organisms or their offspring; pose a substantial present or future danger to the environment; or result in damage to or loss of equipment, property, or personnel.

Hazardous wastes are those substances that have been “abandoned, recycled, or are inherently waste like” and which (because of their quantity, concentration, or characteristics) have the potential to cause an increase in mortality or serious irreversible illness, or pose a substantial hazard to human health or the environment if improperly treated, stored, transported, and/or disposed.

Solid waste refers to nonhazardous garbage, refuse, sludge, and any other discarded solid material resulting from residential, commercial and industrial activities or operations. Solid

waste can be classified as construction/demolition waste, nonhazardous recyclable waste, or nonhazardous, nonrecyclable waste.

For purposes of this analysis, the terms hazardous material and hazardous waste are those substances as defined by the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) and the RCRA.

3.4.1 Regulatory Requirements/Guidance

The RCRA (42 USC 6901) is administered by the US EPA. It regulates the handling, transport, storage, treatment, and disposal of solid and hazardous waste.

The Federal Facility Compliance Act of 1992 (FFCA) (Public Law [PL] 102-386) waives sovereign immunity with respect to Federal, State, and local procedural and substantive requirements relating to the RCRA solid and hazardous waste regulations, and authorizes the US EPA and states to assess civil and administrative penalties and fines against Federal facilities, and criminal fines and imprisonment against violating agents and employees of Federal agencies.

The Hazardous Materials Transportation Act (HMTA) (49 USC 1801) is the Federal legislation that governs the transportation of hazardous materials in the nation.

The Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 USC 11001-11050) was designed to promote emergency planning and preparedness at both State and local levels. It provides citizens and local governments with information regarding the potential hazards in their community. The Act requires the use of emergency planning and designates State and local governments as recipients for information regarding chemicals and toxins used in the community.

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (7 USC 136-136y) establishes regulations for the proper use, storage, and disposal of pesticides. Pesticide management activities are subject to Federal regulations contained in 40 CFR 162, 165, 166, 170, and 171. Air Force Instruction 32-1053, Pest Management Program, implements AFPD 32-10, Installations and Facilities, and DoDI 4150.7, DoD Pest Management Program. This Instruction provides guidance for pest management at Edwards AFB.

Air Force Instruction 32-4002, Hazardous Material Emergency Planning and Response Program, implements AFPD 32-40, Disaster Preparedness, by helping users plan for and respond to DoD emergencies involving hazardous materials. It covers requirements for hazardous materials emergency planning, training, response, and reporting.

Air Force Instruction 32-7042, Solid and Hazardous Waste Compliance, implements AFPD 32-70, Environmental Quality. It identifies compliance requirements for all solid and hazardous wastes, except radioactive waste.[2] In the United States and its territories, use this guidance with applicable Federal, State, and local standards for solid and hazardous waste.

[2]The applicable solid waste regulations are in Subtitle D of Title 40, Code of Federal Regulations (40 CFR) Parts 240 to 244, 257, and 258; for hazardous waste, the applicable regulations are in Subtitle C, 40 CFR 260-272.

Specifically, it contains requirements for solid and hazardous waste characterization, training, accumulation, turn-in and disposal, as well as procedures for managing disposal contracts, inspections, permits, and recordkeeping.

Air Force Instruction 32-7086*, Hazardous Materials Management*, establishes procedures and standards that govern management of hazardous materials throughout the Air Force. It applies to all Air Force personnel who procure, use, or dispose of hazardous materials.

Air Force Flight Test Center Instruction 32-19*, Hazardous Material Management Process*, ensures the AFFTC remains in compliance with all applicable Federal, State, local, and Air Force regulations and laws regarding hazardous materials management. The Instruction involves the use of information systems and positive control of hazardous material to minimize occupational exposures, monitor and minimize environmental releases, and minimize hazardous waste disposal.

The Edwards Air Force Base Hazardous Waste Management Plan Number 32-7042 (HWMP) (AFFTC 1999) supports Air Force directives and is intended to ensure compliance with applicable Federal, State, and local regulations. The objective of the HWMP is to provide sufficient administrative direction and instructions for originators of RCRA and non-RCRA wastes to properly characterize, package, label, store, treat, handle, and transport hazardous waste at Edwards AFB. The goals are to ensure compliance with the applicable Federal, State, and local hazardous waste regulations; simplify administrative procedures; and reduce pollution and environmental impacts through improved waste management practices.

3.4.2 Hazardous Materials

Edwards AFB uses a wide variety of hazardous materials in support of research activities on the Base and its mission requirement to support all types of inventory aircraft. Hazardous materials are used for aircraft repair, maintenance, launch and recovery, Aerospace Ground Equipment (AGE) repair and maintenance, building remodeling, and construction. Some of the most commonly used hazardous materials include jet and motor fuel, other types of petroleum products, paints, thinners, adhesives, cleaners, lead-acid batteries, hydraulic fluids, and halogenated and nonhalogenated solvents (USAF 1995). Typical types of hazardous materials used during natural resources management include pesticides and fuel for vehicles and equipment.

In 1994, the practice of storing hazardous materials within individual lockers at the site of use throughout the Base, including numerous points within the flightline, was replaced with the Haz-Mat Pharmacy (HMP) concept. Implementation of the HMP approach accomplished several important management goals, including reducing the volume of hazardous materials purchased and hazardous wastes generated through improved materials management.

Licensing all users of hazardous materials is critical to the implementation of the HMP, because it requires users to qualify and quantify their need for these materials based on Air Force Technical Orders and best practices. In doing so, it controls and minimizes the distribution and use of hazardous materials. As part of the HMP process, Air Force personnel are required to return unused portions of the hazardous materials/products to their Hazardous

Materials Distribution Support Centers (HDSC) for subsequent use/disposal. The level of materials control established by the HMP has effectively reduced the amount of hazardous materials available for use at Edwards AFB.

A discussion of potential personnel exposure to chemical hazards can be found in Section 3.3, Safety and Occupational Health.

3.4.3 Hazardous Waste

The use of hazardous materials results in generation of hazardous waste (e.g., paint waste, used oil, contaminated rags, etc.), which requires proper handling. The US EPA enforces the RCRA through 40 CFR 260-272, which provides guidelines for the generation, storage, transportation, and disposal of hazardous waste. The Cal-EPA enforces hazardous waste laws embodied in 22 California Code of Regulations (CCR) Chapters 10-20 and the *California Health and Safety Code* (Section 25100). Environmental Management manages hazardous waste accumulation. Guidelines used by Edwards AFB include the *Edwards Air Force Base Hazardous Waste Management Plan Number 32-7042* (AFFTC 1999), which was prepared in accordance with AFI 32-7042*, Solid and Hazardous Waste Compliance*. It establishes procedures to achieve compliance with applicable Federal, State, and local regulations for hazardous waste management, except munitions, explosives, biohazard, and radioactive waste[3]. Specifically, it contains requirements for solid and hazardous waste characterization, training, accumulation, turn-in and disposal, as well as procedures for inspections, permits, and recordkeeping.

The transport of hazardous waste is governed by Department of Transportation (DOT) regulations that specify procedures for transporting these materials on public highways (49 CFR 100-199; 40 CFR 260-272, *Storage, Treatment, and Disposal of Waste*; and CCR Division 4.5, Chapter 13, *Standards Applicable to Transporters of Hazardous Waste*). However, these State and Federal DOT regulations do not apply to the transport of hazardous materials and/or hazardous waste between points on Base.

Department of Defense Directive (DoDD) 6050.8, AFI 32-7042, and 10 USC 2692, *Storage, Treatment, and Disposal of Nondefense Toxic and Hazardous Materials,* do not permit, with a few exceptions, the AFFTC to store or dispose of non-DoD-owned toxic or hazardous material or waste. The contractor is required to remove all hazardous waste generated from the proposed action from Edwards AFB and ensure its proper disposal. In addition, hazardous waste generated from the proposed action is not permitted to be stored at Edwards AFB for a period greater than 90 days. The contractor is required to manage all hazardous materials in accordance with AFFTCI 32-19, *Hazardous Materials Management Process*. This includes informing the appropriate Edwards AFB organizations of the types and quantities of hazardous materials used. Environmental Management will interpret, administer, and provide guidance for solid waste, pollution prevention, and recycling programs as they may apply to the proposed action.

3.5 Biological Resources

In general, biological resources include native and introduced plants that comprise the various habitats, the animals that are found in such habitats, and natural areas that help to support

[3] The applicable hazardous waste regulations are in Subtitle C, 40 CFR 260-272.

plant and wildlife populations. Naturally occurring organisms, the physical and biological aspects of their environment, and the relationships between them make up biological resources (see section 4 of the INRMP for a detailed description of biological resources).

Edwards AFB contains and manages biological resources that are typical of a desert environment. These include animal and plant species (including the associated habitats of each), floodplains, and watersheds.

3.5.1 Regulatory Requirements/Guidance

The *Endangered Species Act of 1973* (ESA) (16 USC 1531-1544) provides a framework for the protection of endangered and threatened species. Critical habitat is defined in the ESA as the geographic area containing physical or biological features essential to the conservation of a listed species or an area that may require special management considerations or protection.

The Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-712), as amended, provides for Federal protection of all migratory bird species, their active nests, eggs, etc. Permits are required to remove these birds and their nests from their roosting and nesting areas.

The Bald Eagle Protection Act (BEPA) (16 USC 668-668d, 54 Stat. 250), as amended, provides for the protection of bald and golden eagles by prohibiting, except under certain specified conditions, the capturing, possession, and selling of such birds, their eggs, feathers, etc.

The Sikes Act (16 USC 670a-670o), as amended, provides for cooperation between the Departments of the Interior and Defense and State agencies in planning, development, and maintenance of fish and wildlife resources on military reservations throughout the United States.

The Fish and Wildlife Coordination Act (FWCA) (16 USC 661-667e) authorizes the Secretaries of Agriculture and Commerce to provide assistance to and cooperate with Federal and State agencies to protect, rear, stock, and increase the supply of game and furbearing animals, as well as to study the effects of domestic sewage, trade, wastes, and other polluting substances on wildlife.

The Animal Damage Control Act (ADCA) (7 USC 426-426b), as amended, is administered by the Secretary of Agriculture and provides broad authority for investigation and control of mammalian predators, rodents, and birds.

The Federal Noxious *Weed Act of 1974* (FNWA) (7 USC 2801 et seq.), under the authority of the Secretary of Agriculture, establishes a Federal program to control the spread of noxious weeds.

The FIFRA (7 USC 136-136y) establishes regulations for the proper use, storage, and disposal of pesticides.

Executive Order (EO) 11988, Floodplain Management, requires that all Federal agencies provide leadership and take action to reduce the risk of flood loss; minimize impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values of floodplains during the acquisition, management, and disposal of Federal lands.

Executive Order 11990, Protection of Wetlands, directs Federal agencies to avoid development in wetlands whenever there is a practicable alternative, and to avoid to the greatest extent possible, adverse impacts associated with the occupancy or modification of wetlands.

Executive Order 13112: Invasive Species, recognizes invasive, nonindigenous species as a problem and creates a multiagency structure and process for identifying gaps in Federal efforts to manage the problem. The Order is intended to support management activities that prevent the introduction of invasive plants, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause.

Executive Order 13186 Responsibilities of Federal Agencies To Protect Migratory Birds states "Federal Agency Responsibilities. (a) Each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations is directed to develop and implement, within 2 years, a Memorandum of Understanding (MOU) with the Fish and Wildlife Service (Service) that shall promote the conservation of migratory bird populations."

Department of Defense Instruction 4150.7, DoD Pest Management Program, outlines the policies, responsibilities, and procedures for implementation of pest management programs, and requires the certification of pest managers. The Technical Information Memorandum (TIM), a guidance supplement to DoDI 4150.7, outlines specific criteria and operational procedures for the implementation of pest management programs.

Department of Defense Directive 4700.4, Natural Resources Management Program, prescribes policies and procedures for an integrated management program of natural resources on DoD property. Enforcement of laws primarily aimed at protecting natural resources and recreation activities that depend on natural resources, is an integral part of a natural resources program and shall be coordinated with, or under the direction of, the natural resources manager for the affected area.

Air Force Instruction 32-1053, Pest Management Program, addresses policies, responsibilities, and procedures for pest management at Air Force installations.

Air Force Instruction 32-7064, Integrated Natural Resources Management, implements AFPD 32-70, Environmental Quality, and DoDD 4700.4, *Natural Resources Management*. Air Force Instruction 32-7064 explains how to manage natural resources on Air Force property. The INRMP is a key tool for managing the installation's natural resources.

3.5.2 Animal Species

Table 4 lists species found within the project area and summarizes the concerns associated with them.

While there are several species of interest at Edwards AFB, there is only one listed species with legally required mandates on management practices. The desert tortoise (*Gopherus agassizii*) is an herbivorous reptile whose native range includes the Sonoran and Mojave deserts of southern California, southern Nevada, Arizona, extreme southwestern Utah, and Sonora and northern Sinaloa, Mexico. Desert tortoises are known to occur at Edwards AFB (AFFTC 1996b).

TABLE 4
ON-BASE ANIMAL SPECIES OF INTEREST POTENTIALLY AFFECTED BY THE PROPOSED ACTION

Common Name	Scientific Name	Federal Designation	State Designation	Other Designation	Specific Habitat Concerns	Comments
Desert Tortoise	*Gopherus agassizii*	Threatened	Threatened	ESA	General habitat loss, predation, and disease. Critical habitat.	Fremont-Kramer Critical Habitat Unit located on Edwards AFB,
Bald Eagle	*Haliaeetus leucocephalus*	Threatened (proposed for delisting)	Endangered	BEPA, MBTA	Powerline perches have traditionally been a cause for eagle mortality.	Occurrence at Edwards AFB is considered accidental during winter months.
California Least Tern	*Sterna antillarum browni*	Endangered	Endangered	MBTA	Nesting colonies.	Sighted on Edwards AFB 12 May 1996. Sighting considered highly irregular. No nesting believed to occur on Base.
Peregrine Falcon	*Falco peregrinus anatum*	Delisted	Endangered	MBTA	Cliffs and high perches.	Peregrine falcons have not been observed nesting on Edwards AFB.
Swainson's Hawk	*Buteo swainsoni*	None	Threatened	MBTA	High perches.	Occurs at Edwards AFB during the spring and fall migration.
Golden Eagle	*Aquila chrysaetos*	None	None	BEPA, MBTA	High perches	Considered uncommon on Edwards AFB.
Mohave Ground Squirrel	*Spermophilus mohavensis*	None	Threatened	None	Occupies the northwestern Mojave Desert, including San Bernardino, Los Angeles, Kern, and Inyo Counties.	Primarily active aboveground during spring and early summer. Populations occur in various areas of Edwards AFB.

Notes: ESA – Endangered Species Act
BEPA – Bald Eagle Protection Act
MBTA – Migratory Bird Treaty Act
AFB – Air Force Base

The proposed project is located within the habitat of the desert tortoise. The desert tortoise is Federally listed as threatened under the ESA and State listed as threatened by the California Fish and Game Commission. The desert tortoise is a native to western deserts, including the West Mojave.

In 1994, the USFWS designated portions of the Base as "desert tortoise critical habitat" (USFWS 1994). The boundary designated as "desert tortoise critical habitat" encompasses approximately 60,800 acres in the eastern and southeastern portions of Edwards AFB. Figure 6 shows the critical habitat for the desert tortoise.

The PIRA is divided into three management zones with respect to the desert tortoise (Figure 7). Zone 1 Management Area is the most disturbed of the areas on the PIRA due to AFFTC operations (precision bombing and infrared target areas). Zone 2 Management Area contains some disturbance, but most areas have not been greatly affected. Zone 3 Management Area is relatively undisturbed and contains most of the desert tortoise critical habitat on Base.

The lakebeds on Edwards AFB were surveyed and sampled to provide initial species identification and distribution of freshwater shrimp. Biologists have identified five eubranchiopod shrimp species in Rogers Dry Lake. These include: clam shrimp (*Eocyzicus digueti*), tadpole shrimp (*Lepidurus lemmoni*), and three species of fairy shrimp (*Branchinecta mackini*, *B. gigas, and B. lindahli*) (AFFTC 1992). Eubranchiopods lie dormant in the soil of dry lakebeds until flooding creates the aquatic habitat necessary to complete their life cycles. These shrimp are a food source for a variety of migratory shorebirds that congregate at Rosamond Dry Lake when water is present.

Common mammals on Edwards AFB include the black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audobonii*), and coyote (*Canis latrans*). Common rodents include the deer mouse (*Peromyscus maniculatus*), grasshopper mouse (*Onychomys torridus*), little pocket mouse (*Perognathus longimembris*), Merriam's kangaroo rat (*Dipodymus merriami*), and desert woodrat (*Neotoma lepida*). Common bats include the western pipistrelle (*Pipistrellus hesperus*) and little brown bat (*Myotis lucifugus*). For a list of mammals at Edwards AFB, see the *Biological Resources Environmental Planning and Technical Report Basewide Vegetation and Wildlife Surveys and Habitat Quality Analysis* (Mitchell et al 1993).

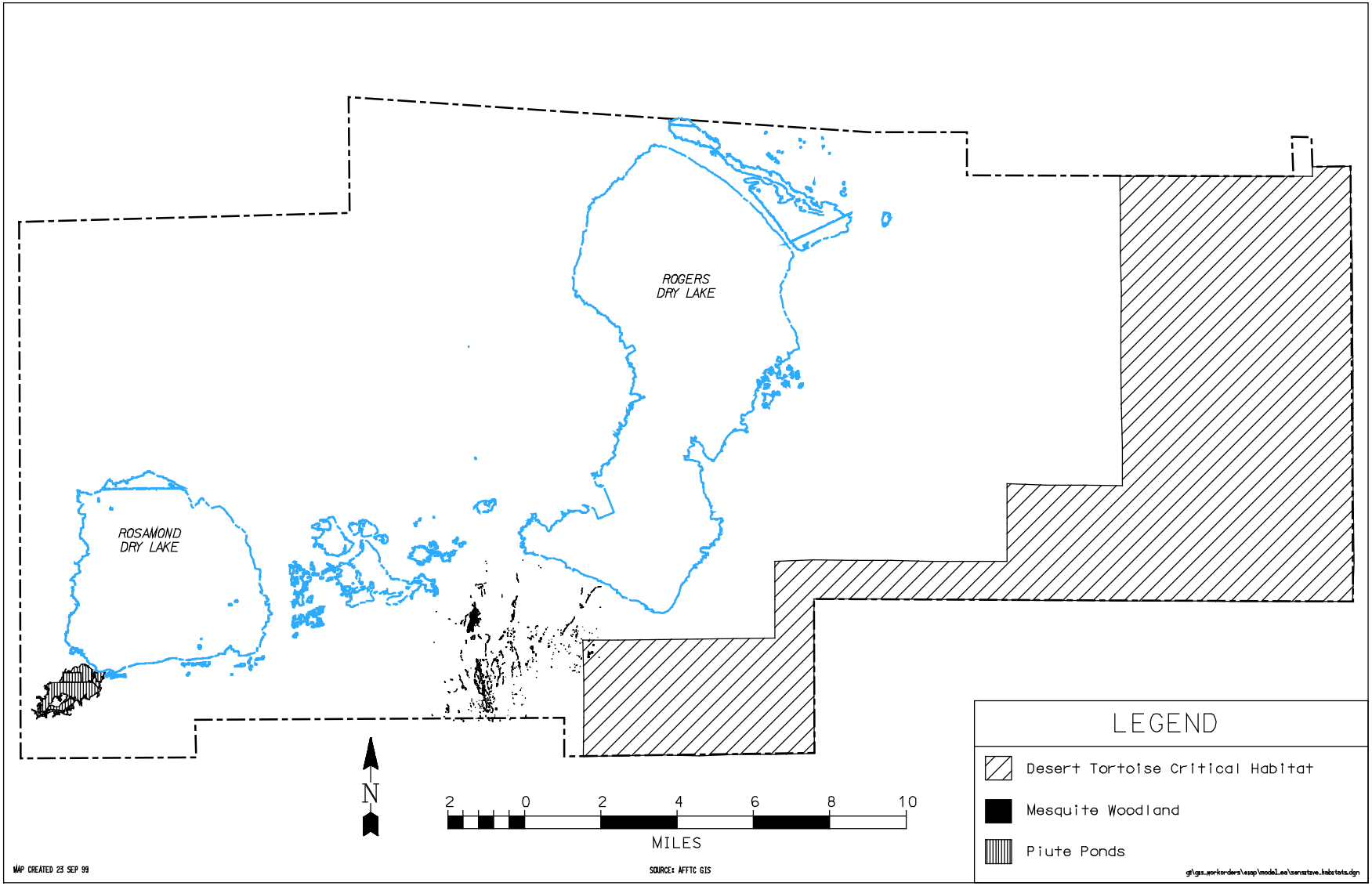


Figure 6 Regional Critical Habitat Map

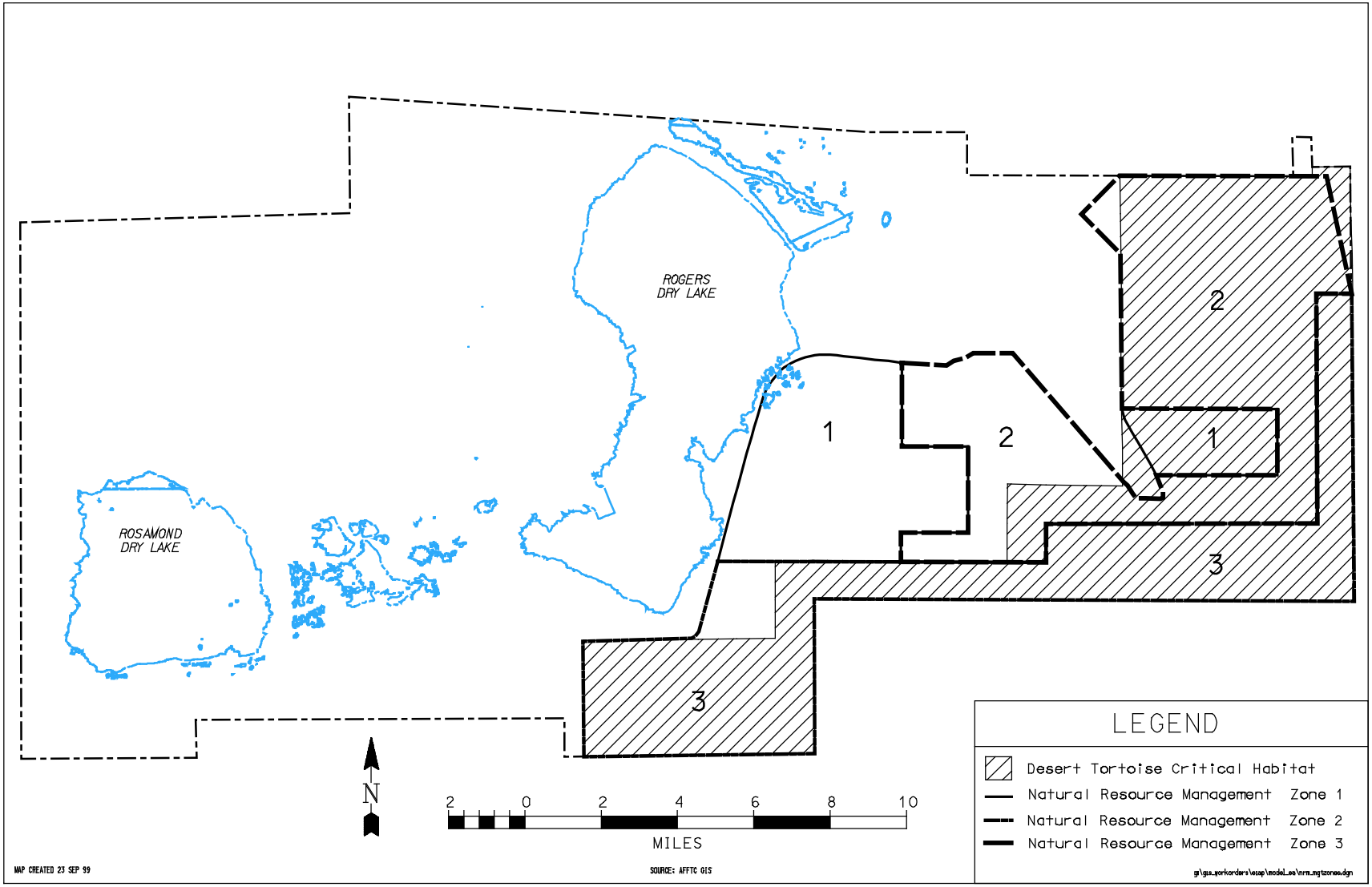


Figure 7 Critical Habitat Zone Map

Common birds include the turkey vulture (*Cathartes aura)*, common raven (*Corvus corax*), sage sparrow (*Amphispiza belli*), barn owl (*Tyto alba*), house finch (*Carpodacus mexicanus*), and western meadowlark (*Sturnella neglecta*). Joshua tree woodlands support cactus wren (*Campylorhynchus brunneicapillus*) and ladder-backed woodpecker (*Picoides scalaris*). Common bird species found in creosote scrub include the horned lark (*Eremophila alpestris*), black-throated sparrow (*Amphispiza bilineata*), and sage sparrow (*Amphispiza belli*). The seasonal inundation of lakebeds and claypans attracts wading bird species, including the black necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), and greater yellowlegs (*Tringa melanoleuca*). Birds associated with ponds include the yellow-headed blackbird (*Xanthocephalus xanthocephalus*), black-crowned night heron (*Nycticorax nycitorax*), and green heron (*Butorides striatus*). Seasonal migratory birds use both permanent and temporary bodies of water for foraging on shrimp. These birds include ducks and geese such as the ruddy duck (*Oxyura jamaicensis*), northern mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), Canada goose (*Branta canadensis*), and snow goose (*Chen caerulescens*). Ducks and geese are hunted in designated areas on Base. For a list of birds at Edwards AFB, see the *Biological Resources Environmental Planning and Technical Report Basewide Vegetation and Wildlife Surveys and Habitat Quality Analysis* (Mitchell et al 1993).

To date, the only amphibians identified on Base include the western toad (*Bufo boreas*), Pacific tree frog (*Hylla regilla*), red-spotted toad (*Bufo punctatus*), and African clawed frog (*Xenopus laevis*). These have been identified at Piute Ponds by United States Geological Survey (USGS) biologists during a survey in 1997, *African Clawed Frog (Xenopus laevis) on Edwards AFB*. Common reptiles on Base include the desert spiny lizard (*Sceloporus magister*), side-blotched lizard (*Uta stansburiana*), western whiptail (*Cnemidophorus tigris*), zebra-tailed lizard (*Callisaurus dracoinides*), glossy snake (*Arizona elegans*), coachwhip (*Masticophis flagellum*), gopher snake (*Pituophis melano leucus*), and the Mojave green rattlesnake (*Crotalus scutulatus*). For a list of reptiles and amphibians at Edwards AFB, see the *Biological Resources Environmental Planning and Technical Report Basewide Vegetation and Wildlife Surveys and Habitat Quality Analysis* (Mitchell et al 1993).

California ground squirrels (*Spermophilus beecheyi*) are considered a nuisance on Edwards AFB. Their populations have been increasing in the developed areas and are responsible for damage to landscaped areas caused by their digging and burrowing activities. Sometimes they find their way into inhabited homes and other buildings/facilities causing widespread damage to the interior of buildings. Edwards AFB attempts to control their populations with various methods (AFFTC 1996a).

3.5.3 Plant Species

The following is not a complete list of the Edwards AFB floral species. For a complete list of plant species at Edwards AFB, see *Plant Species at Edwards Air Force Base* (Charlton 1994). Creosote bush scrub is dominated by creosote bush (*Larrea divaricata*). At Edwards AFB, there are approximately 103,000 acres of creosote bush scrub, which comprises approximately 34 percent of the area of the Base. Common species found in this community include winterfat (*Ceratoides lanata*), cheesebush (*Hymenoclea salsola*), and Nevada tea (*Ephedra nevadensis*).

Joshua tree woodland is dominated by Joshua trees (*Yucca brevifolia*). At Edwards AFB, there are approximately 52,800 acres of Joshua tree woodland that comprise approximately 17 percent of the area of the Base. Typically, Joshua tree woodland understories include saltbush and creosote bush habitats. Common species found in this community include creosote bush, saltbush species, the native desert dandelion (*Malacothrix glabrata*), pincushion (*Chaenactis sp.*), and fiddleneck (*Amsinckia tesselata*).

Halophytic phase saltbush scrub is dominated by four species of the genus Atriplex: spinescale (*A. spinifera*), shadscale (*A. confertifolia*), four-wing saltbush (*A. canescens*), and quailbush (*A. lentiformes*). At Edwards AFB, there are approximately 55,300 acres of Halophytic phase saltbush scrub, which comprises approximately 18 percent of the area of the Base. A common species found in this community includes saltgrass (*Distichlis spicata*).

Xerophytic phase saltbush scrub is dominated by allscale (*Atriplex polycarpa*). At Edwards AFB, there are approximately 45,300 acres of arid phase saltbush scrub which comprises approximately 15 percent of the area of the Base. Common species found in this community include burrobush (*Ambrosia dumosa*), goldenhead (*Acamptopappas sphaerocephalus*), and cheesebush (*Hymenoclea salsola*).

The California Native Plant Society (CNPS) Rare Plant Program maintains an inventory of over 1,800 species of endangered and rare plants of California. This information is summarized in the CNPS Inventory of Rare and Endangered Vascular Plants of California, now in its fifth edition.

Table 5 provides a summary of the plants and habitats of interest in the proposed project area. Figures 8 through 10 show the specific locations of these plant species.

The County of Los Angeles General Plan established 61 Significant Ecological Areas (SEAs) that represent a wide variety of biological communities within the County. These areas have special management concerns.

The Los Angeles County General Plan has identified two SEAs on the Base, Edwards AFB (SEA 47) and Rosamond Lake (SEA 50). Significant Ecological Area 47 contains botanical features that are unique and limited in distribution in Los Angeles County. They include the only good stands of mesquite (*Prosopis glandulosa*) in Los Angeles County. The area contains fine examples of creosote bush scrub, alkali sink, and the transition vegetation between the two. Mesquite woodlands provide habitat for a variety of mammals, birds, and reptiles.

Significant Ecological Area 50 is the best example of the shadscale scrub and alkali sink biotic communities in Los Angeles County. It also contains Piute Ponds in the southwestern corner of the Base. Piute Ponds supports a variety of wildlife, especially birds. These ponds provide a stopover area for migratory birds.

TABLE 5
ON-BASE PLANT SPECIES AND HABITATS OF INTEREST AFFECTED BY THE PROPOSED ACTION

COMMON NAME	SCIENTIFIC NAME	DESCRIPTION	FEDERAL DESIGNATION	STATE DESIGNATION	OTHER DESIGNATION	COMMENTS
Desert Cymopterus	*Cymopterus deserticola*	A herbaceous perennial that flowers in the spring. Approximately 6 inches tall, smooth leaves with white or silver edges, and small, dense, purple cluster flowers.	None.	None.	California Native Plant Society (CNPS) Sensitive Plant List..	Occurs in creosote bush scrub and halophytic phase saltbush scrub between 2,100 and 3,000 feet.
Barstow Woolly Sunflower	*Eriphyllum mohavense*	A small annual, about 1 inch tall that flowers between March and May. The heads contain three to four yellow tubular flowers.	None.	None.	CNPS	Occurs in creosote bush scrub, arid phase saltbush scrub, and near claypans between 1,500 and 3,300 feet.
Alkali Mariposa Lily	*Calachortus striatus*	A perennial plant, about 20 inches tall, that flowers in the spring. Flowers are bell-shaped containing three wedge-shaped lavender petals.	None.	None.	CNPS	Occurs in meadows and alkali sink habitats near Rogers, Rosamond, and Buckhorn Dry Lakes and at elevations around 2,100 to 2,300 feet.

Figure 8 On-Base Locations of Barstow Woolly Sunflower **Source: AFFTC, 1995d**

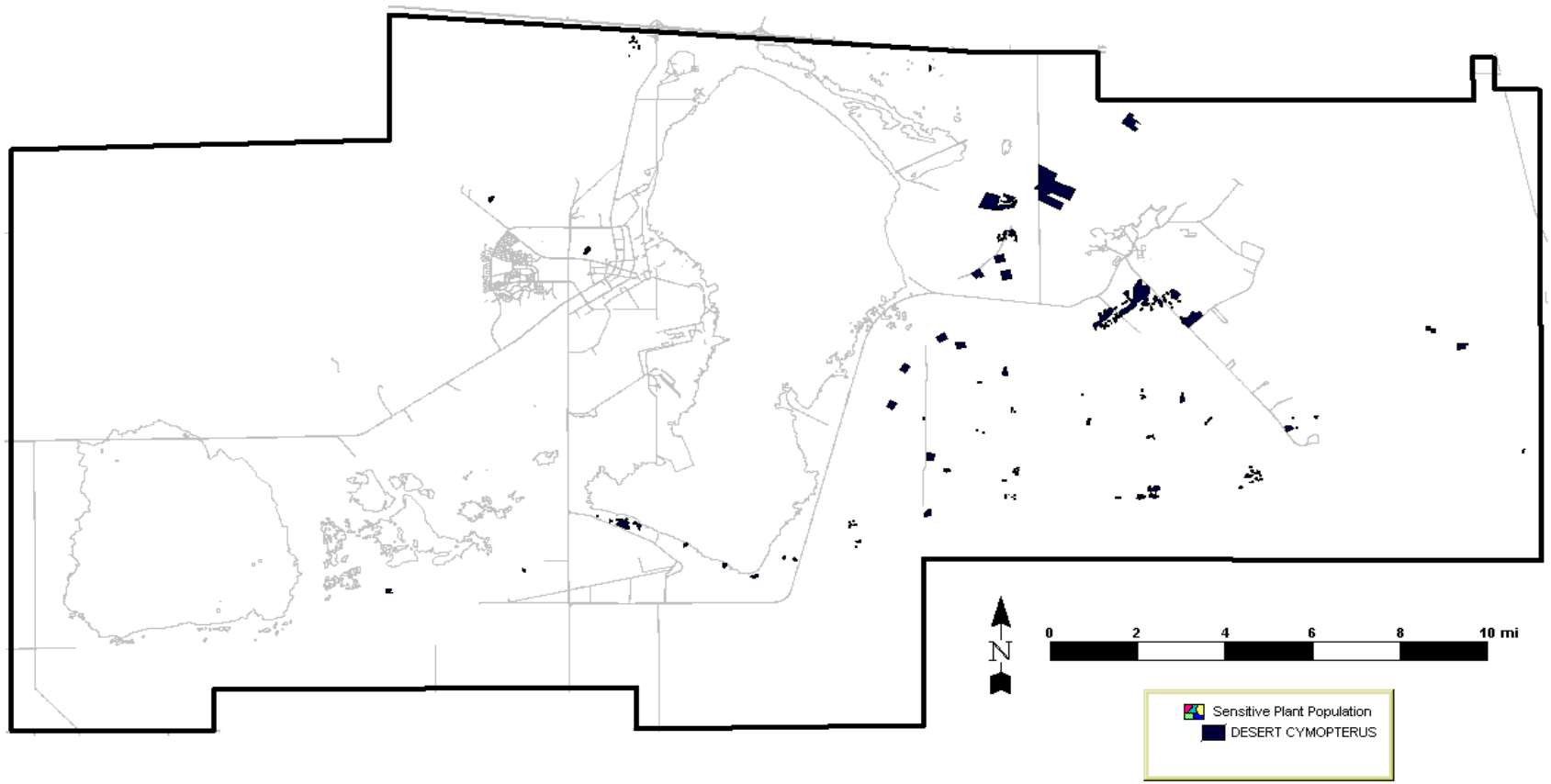


Figure 9 On-Base Locations of Desert Cymopterus **Source: AFFTC, 1995d**

Figure 10 On-Base Locations of Alkali Mariposa Lily **Source: AFFTC, 1995d**

3.5.4 Floodplains

Edwards AFB is situated at the bottom of the Antelope Valley Watershed Basin, roughly a 2,400 square-mile watershed with no outlet. As such, stormwater runoff for the entire watershed is directed toward three large playa lakebeds: Rogers, Rosamond, and Buckhorn Dry Lakes. Any water reaching these lakebeds is trapped, pending evaporation (USGS 1998).

In general, drainage tends to flow toward the nearest dry lakebed. Rosamond and Buckhorn Dry Lakes, in turn, drain toward Rogers Dry Lake (AFFTC 1993b). Water level elevations (above mean sea level [MSL]) for Rosamond Dry Lake during flood conditions are described in Table 6 (United States Army Corps of Engineers [USACOE] 1995).

Despite the apparent potential for the formation of a sizable lake, the playa lakebeds remain dry most of the time due to arid climate conditions. The average annual rainfall at the Base is approximately 5 inches and the maximum-recorded 1-year rainfall was 15.5 inches in 1983. The average annual evaporation, as measured by a nearby Mojave pan evaporation gauge from 1939 to 1959, was 11.4 inches. Even during the winter rainy season of November to April, the average monthly precipitation ranges between 0.5 and 1.5 inches, with a maximum-recorded 1-month rainfall of 5.5 inches in March 1983. For each of these months, the average Mojave gauge evaporation exceeds the average Edwards AFB precipitation (AFFTC 1993b).

The Mojave Creek Floodplain is a well-defined drainage that runs southeast along the north and east of the residential area of Main Base along Lancaster Boulevard and crosses Rosamond Boulevard where it runs southward just west of South Base and empties into Rogers Dry Lake (Figure 11). Mojave Creek is dry for most of the year, but periodic flooding does occur during above-normal rainfall periods (AFFTC 1993b).

In 1993, a flood study of the Base was conducted to determine floodplain constraints (AFFTC 1993b). Flood-prone areas that were identified include Rogers and Rosamond Dry Lakes, and Mojave Creek. Mojave Creek empties into Rogers Dry Lake. There are other flood-prone areas on Base in the residential area where water is trapped and no channels are present to divert heavy stormwater runoff.

The AFFTC 1993 flood study estimated a “flood of record” inundation elevation to be used for planning purposes and a risk of flooding analysis of existing Base facilities near Rogers Dry Lake. This level represents the maximum water surface elevation that would occur during a flood

TABLE 6
WATER LEVELS FOR ROSAMOND DRY LAKE FLOODING EVENTS

FLOOD LEVEL	LAKE ELEVATION
50-year	2280.9 feet
100-year	2282.2 feet
200-year	2283.4 feet

Source: USACOE, 1995, *Repair Rosamond Boulevard, Edwards Air Force Base, California, Study of Alternatives*

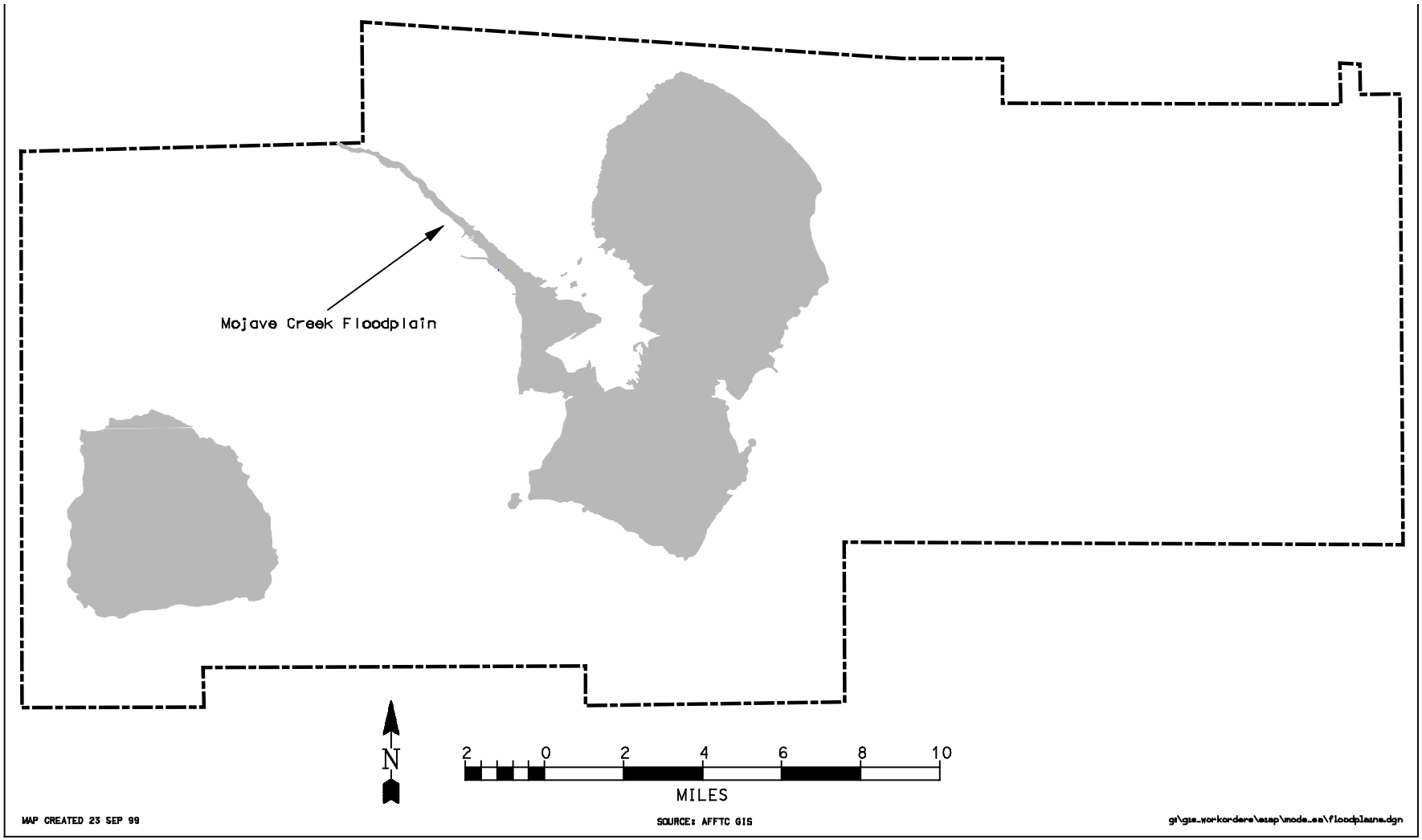


Figure 11 Mojave Creek Floodplain

of reasonably high return interval (e.g., 50 years, 100 years, etc.). The level of flooding that occurred in 1943 was estimated to be the flood-of-record level. Most development on Edwards AFB is above this estimated flood level of 2,277.4 feet. Relatively high flooding in 1993 remained more than 3 feet below the estimated 1943 flood level (AFFTC 1993d).

3.6 Cultural Resources

Cultural resources are defined by AFI 32-7065, *Cultural Resources Management*, as any historical, archaeological, or American Indian artifacts and properties of interest. Cultural resources at Edwards AFB include archaeological resources (including those from prehistoric and historic periods), historic period resources (including historic period structures and objects), and traditional cultural places.

As of May 2001, over 2,822 archaeological sites had been identified on Edwards AFB. Of these, 109 sites have been evaluated for listing on the National Register of Historic Places (National Register); over 50 of these sites have been found eligible or potentially eligible for listing on the National Register either on individual merit or as contributing elements of historic districts. Of these, over 1,606 sites represent the prehistoric period, and over 1,146 date to the historic period. Prehistoric period sites include villages, temporary camps, rock shelters, milling stations, lithic deposits, quarries, cremations, rock features, and rock art. Historic period archaeological sites include refuse deposits, rock cairns, railroad grades, roads and trails, abandoned mines and homesteads, buildings and facilities, rock alignments, wells, and military sites. There is one National Historic Landmark on Edwards AFB, which is in the northern portion of Rogers Dry Lake.

3.6.1 Regulatory Requirements/Guidance

The NHPA of 1966, as amended (16 USC 470 et seq.), provides for the establishment of the National Register and authorizes the establishment of criteria to determine the eligibility of cultural sites for listing on the National Register. Section 106 of the NHPA requires Federal agencies to evaluate the effects of their activities and programs on eligible cultural resources (which include prehistoric and historic archaeological resources, historic resources, and traditional cultural places). Section 110 of the NHPA directs Federal agencies to undertake actions necessary to minimize harm to cultural resources under their ownership or control, or affected by their activities and programs. Compliance with 16 USC 470 et seq., NHPA; 36 CFR Part 800, *Protection of Historic Properties*; and AFI 32-7065, *Cultural Resources Management*, at Edwards AFB is coordinated by the Base Historic Preservation Officer (BHPO).

The *Archaeological Resources Protection Act* (ARPA) (16 USC 469) was intended to address the growing concern about the plundering of archaeological and historic sites. The Act makes it illegal to remove any archaeological resources from Federal or Indian lands without a permit. Violations of the ARPA can result in fines of up to $250,000 and up to 5-years imprisonment.

The *Native American Graves Protection and Repatriation Act* (NAGPRA) (25 USC 3001 et seq.) requires Federal agencies and institutions (i.e., museums) that receive Federal funding to inventory their collections of American Indian human remains, funerary objects, sacred objects, and objects of cultural patrimony. American Indians must be given the opportunity to reclaim

these items. It requires consultations with American Indians regarding the avoidance of archaeological burial sites. It requires halting excavation and consulting with representatives of local American Indian groups if a burial is encountered in the course of archaeological or other excavations. The Act also makes it illegal for anyone to buy or sell American Indian human remains or sacred objects.

The *Antiquities Act of 1906* (16 USC 431-433) prohibits the excavation of antiquities from public lands without a permit from the Secretary of the Interior.

The *Archaeological and Historical Preservation Act of 1974* (16 USC 470) requires all agencies to report to the Secretary of the Interior if any of their projects may cause the loss of "significant scientific, prehistorical, historical, or archaeological data." The Act gives them the choice of recovering threatened data themselves or asking the Department of the Interior to do it for them, and it authorizes them to transfer up to 1 percent of the cost of the project to the Department of the Interior to support salvage.

3.7 Geology and Soils

Geologic resources consist of naturally formed minerals, rocks, and unconsolidated sediments. Soil refers to the uppermost layers of surficial geologic deposits and is developed by the weathering of those deposits. Concerns associated with the geologic setting at Edwards AFB, which could either affect or be affected by a proposed project, include: topography, material site use (mining), Installation Restoration Program (IRP) site disturbance, seismicity, and land subsidence.

The geologic setting in the vicinity of the Edwards AFB area is characterized by three major rock types or geologic complexes: a basement complex of igneous and metamorphic rocks; an intermediate complex of continental volcanic and sedimentary rocks; and valley fill deposits. The basement complex is of pre-Tertiary age and includes quartz monzonite, granite, gneiss, schist, and other igneous and metamorphic rocks. These rocks crop out in the highlands surrounding the playa areas and occur beneath the unconsolidated deposits of the playa. The intermediate complex, with limited exposure in the Edwards AFB vicinity, is of Tertiary age and includes a variety of sedimentary and volcanic rock types (Dutcher and Worts 1963).

The United States Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS) has completed a soil survey of Edwards AFB for the USACOE (*Soil Survey of Edwards Air Force Base, California*). Based on this survey, the soils at Edwards AFB can be characterized as predominantly alkaline, consisting of loams, sandy loams, and loamy sands, all of which are susceptible to wind and water erosion. According to the *Soil Survey of Edwards Air Force Base, California - Supplemental Soil Interpretations* (USDA Soil Conservation Service [SCS] 1998), the soils at Edwards AFB are given erosion hazard ratings of slight to severe for wind erosion and slight to moderate for water erosion.

A discussion of air quality concerns associated with wind erosion can be found in Section 3.2, Air Quality.

3.8 Socioeconomics

Socioeconomic resources are the economic, demographic, and social assets of a community. Key elements include fiscal growth, population, employment, housing, schools, and environmental justice.

For the purpose of this EA, the boundary of the socioeconomic environment is defined by those counties, or portions of counties, in which the proposed action will occur. The economic impact region (EIR) includes all areas within this boundary. The EIR for an impacted community is fundamentally important to the analysis because it defines the area in which changes in fiscal growth, population, labor force and employment, housing stock and demand, and school enrollment will be assessed. The EIR for Edwards AFB is that area located within 75 miles of Main Base, and includes portions of Los Angeles, Kern, and San Bernardino counties. However, a majority of potential socioeconomic impacts from Base activities would be expected to occur within the Antelope Valley area (Figure 12).

Social institutions[4], defined ways of life[5], and the availability of recreation activities all influence the way individuals and communities view their quality of life.

3.8.1 Regulatory Requirements/Guidance

Department of Defense Directive 1015.2, *Military Morale, Welfare, and Recreation (MWR)*, requires the establishment of a well-rounded MWR program that contributes to mission readiness and improves productivity through programs promoting fitness, esprit de corps, and quality of life for authorized personnel.

Department of Defense Instruction 1015.10, Programs for Military Morale, Welfare, and Recreation (MWR), implements policy, assigns responsibilities, and prescribes procedures for operating and managing military MWR programs.

Air Force Instruction 34-110, Air Force Outdoor Recreation Programs, provides guidance for starting and running outdoor recreation programs at Air Force installations.

Air Force Flight Test Center Instruction 32-8, *Management and Conservation Program for Fish and Wildlife*, sets up policies and explains procedures for the control of hunting and fishing on Edwards AFB. It applies to all who hunt and fish on Base. This Instruction assigns organizational responsibilities, directs actions, and prescribes procedures for management, supervision, and operation of the AFFTC Wildlife Conservation Program.

3.8.2 Fiscal Growth

Edwards AFB makes a substantial contribution to the economic status of the surrounding communities within the Antelope Valley of California. For Fiscal Year 1998, the estimated cumulative economic impact from Edwards AFB's annual operating expenditures including

[4] Social institutions encompass educational, family, economic, military, religious, and recreational/leisure.
[5] Defined ways of life encompass subsistence hunting and fishing, stability and change, cohesion and conflict, and community identity.

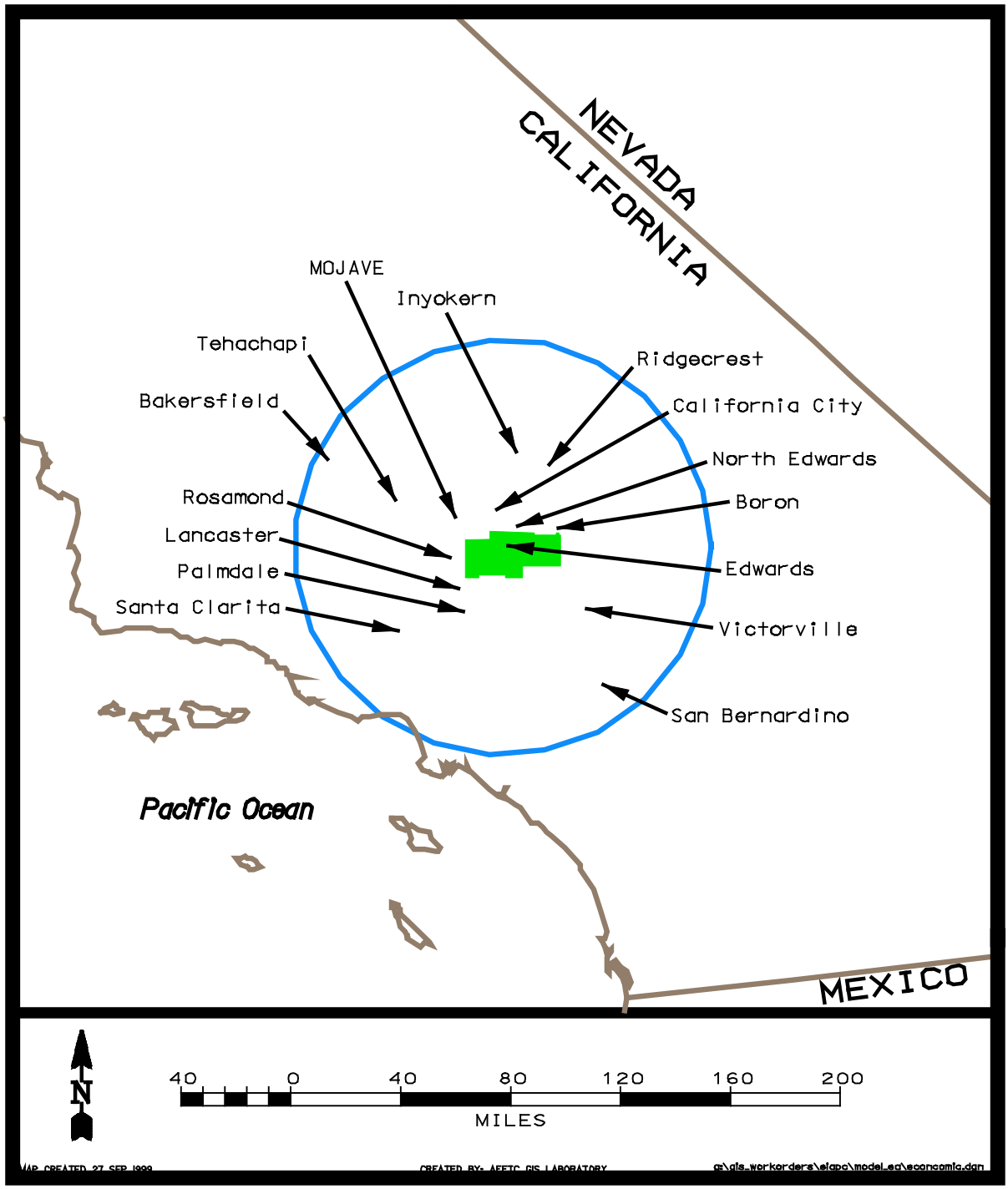


Figure 12 Economic Impact Region Map

salaries, DoD acquisitions, and educational assistance on the surrounding communities was $1,288,582,775 (AFFTC 1998c).

3.8.3 Quality of Life

Edwards AFB provides a variety of programs, services, and recreation activities to enhance the quality of life of its military members and their families. These include the Aero Club, Skill Development Center, Outdoor Recreation, Equipment Checkout, bowling center, golf course, riding stables, Rod and Gun Program (CAR), Oasis Aquatic Center, Tickets and Tours, Family Camp, Sports and Fitness Center, Aerobics Center, Community Activity Center, Child Development Center, Youth Center, hunting/fishing areas, Desert Wheels Motorcycle Club, and ORV areas.

Natural Resource Management, in coordination with Services, primarily manages the Hunting and Fishing program; the remainder of the outdoor recreation program activities are managed through Services.

Hunting. Hunting on Base is open to active-duty and retired military and their dependents; other Federal and contractor employees assigned to the Base and their dependents; and grandfathered members of the Rod and Gun Program; or guests being sponsored by the above. Hunting is allowed in authorized areas only and according to a specified schedule. Waterfowl hunting is allowed at Piute Ponds. The Quail Conservation Area is closed to hunting. Dove hunting is generally permitted in Hunting Areas 1, 2, 3, and 7, with the exception of the quail conservation area portion of Area 2. Quail and chukar hunting is generally permitted on Wednesdays, Sundays, and Federal holidays in Hunting Areas 1, 2, and 3, with the exception of the quail conservation area portion of Area 2. Rabbit hunting is allowed in Hunting Areas 1 and 2, with the exception of the Quail Conservation Area portion of Area 2. Harvest data are provided to the USFWS and CDFG to help provide a basis for harvest management decisions.

Fishing. Fishing on Base is open to active duty and retired military members and their dependents; other Federal and contractor employees assigned to the Base and their dependents; and guests being sponsored by the above. Fishing is allowed only in Branch Memorial Park Pond year-round, from dawn to midnight, except when the pond is temporarily closed (generally for fish stocking).

Off-Road Vehicle. Off-Road Vehicle Area No. 1 (approximately 100 acres in size) is for the use of the Desert Wheels Motorcycle Club only. Off-Road Vehicle Area No. 2 is 15,040 acres, and is jointly used for equestrian, ORV, and general recreational use. All off-road vehicles must be licensed and insured, and operated only within designated trails in ORV areas. Signs are placed at least every 1/2-mile along the boundary to delineate the ORV area. Bulletin boards are placed in at least two main access areas providing rules and safety information. Patrols in the area are used to ensure that riders remain within the boundaries and use existing trails.

Camping. Two designated camping areas are available on Base. The Family Campground (Fam Camp) is for the use of active-duty and retired military, DoD contractor, and civilian personnel, their dependents and guests. The Scout Camp is used for scout activities only.

Riding Stables. The Base equestrian facilities consist of 42 stables (capacity for 80 horses), an exercise and training area, and a large open riding area. Equestrian use of the ORV trails is allowed.

Golf Course. The 18-hole golf course and driving range at Edwards AFB is located within the Military Family Housing (MFH) Area.

Other recreation programs. Jogging, par course, hiking, Muroc Model Masters, and bicycle trails are located within the Main Base and MFH areas. Picnicking and ball fields are also located within these areas and at designated recreational areas such as Branch Memorial Park.

Ecological recreational and education opportunities exist at Piute Ponds. Group tours and individual viewings are made by bird watchers and naturalists after coordination with Natural Resource Management; these activities must be approved by the Base Commander. Bird watchers and other naturalists conduct group tours and individual viewings after coordination with the Environmental Management Directorate. Archeological and historic sites on Base also provide educational opportunities. These areas are patrolled by Security Police to guard against vandalism.

3.9 Environmental Justice and Protection of Children

3.9.1 Regulatory Requirements/Guidance

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), requires that Federal agencies conduct their programs, policies, and activities that substantially affect human health or the environment in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under such programs, policies, and activities because of their race, color, or national origin. The essential purpose of EO 12898 is to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, State, Tribal, and local programs and policies. See Appendix A for a detailed breakdown of this issue.

Executive Order 13045, *Protection of Children from Environmental Health and Safety Risks* (April 21, 1997) requires Federal agencies, to the extent permitted by law and mission, to identify and assess environmental health and safety risks that might disproportionately affect children. The Order further requires Federal agencies to ensure that their policies, programs, activities, and standards address these disproportionate risks. The Order defines environmental health and safety risks as "risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink and use for recreation, the soil we live on, and the products we use or are exposed to)."

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4.0 ENVIRONMENTAL CONSEQUENCES

This section of the document assesses known, potential, and reasonably foreseeable environmental consequences related to the development and implementation of an INRMP and managing natural resources at Edwards AFB. This section is organized into subsections that discuss each environmental resource. Each subsection is divided into two parts. The first part addresses the regulatory background of each of the potentially affected environmental resources. The second part addresses the environmental impacts of the proposed action for each of the alternative plans. General overall impacts to these resources are discussed, including the impacts of the No Action Alternative (status quo/low level of active management plan). In addition to impacts in the United States (July 1, 1997) guidance from CEQ states that agencies "must include an analysis of reasonably foreseeable transboundary effects of proposed actions in their analysis of proposed actions in the United States." Actions that impact migratory species, air quality, watersheds, and other components of natural ecosystems are types of actions that may have impacts across international borders. Should any potential impacts be identified, agencies with relevant expertise in the affected country would be contacted.

The *Sikes Act* requires an INRMP to provide goals and objectives for managing natural resources including a course of action designed to improve the management of Edwards AFB natural resources. An INRMP should allow flexibility in management options, as more information becomes available from ongoing monitoring and planned studies. The impacts identified in this analysis range from no impact to either beneficial or minor adverse impacts. An INRMP is intended to be a "living" document that focuses on a 5-year planning period based on past and present actions. Short-term management practices included in the Plan have been developed without compromising long-range natural resources goals and objectives (a summary of the specific goals by resource area may be found in the INRMP). The selected alternative plan will be reviewed annually and updated every 5 years. Additional environmental analyses may be required as new management measures are developed and incorporated into the Plan to stay current with the changes at the installation. The impacts and alternatives are evaluated in this EA at the programmatic level of the Plan.

Effectiveness/compliance monitoring is considered an essential part of the action alternatives considered. Without effectiveness monitoring it is not possible to have a science-based adaptive management program. Adaptive management relies on the ability to accurately determine what is and is not working and to make changes in management practices through time. An end state with biodiversity that mimics natural conditions is the ultimate goal.

4.1 Land Use

There are no natural lakes or ponds, and no intermittent or permanent streams or rivers on Edwards AFB. There are also no jurisdictional wetlands or "Waters of the United States." All of the alternatives considered would be compatible with the *Edwards AFB General Plan*. Few, if any, projects for natural resource management would be close enough to flightline operations to produce FOD or BASH issues.

4.1.2 Alternative A Impacts

The Edwards AFB targeted management plan provides an overall guide for land use as it relates to natural resource management. The objectives of the plan are to ensure conservation of the land by adopting land-use practices based upon soil capabilities, the improvement of the training areas through the preservation of natural terrain and vegetation, and the prevention of damage or destruction of valuable natural resources because of a lack of knowledge or misuse. The long-term monitoring program monitors all restoration, erosion control, and natural resource projects to insure their successful completion. From the perspective of habitat, implementation of the preferred alternative would result in improved habitat conditions for the flora and fauna and would maintain the natural level of species diversity, accomplishing the priority goal of the INRMP.

This alternative has only a limited potential for adverse impacts because the Edwards AFB targeted plan provides an overall guide for land-using ecosystem management principles. In addition to ongoing Air Force mission activities, the Edwards AFB targeted plan calls for a small increase in pesticide use on Base primarily in the undeveloped areas. While increased pesticide use could be considered contrary to EO 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements*, it may be necessary to control the noxious weeds invading the various native plant communities. Wildfires are controlled and the use of fire as a management tool is limited under this alternative and not expected to produce negative impacts. Edwards AFB would rehabilitate additional wildlife habitat by implementing exotic weed control measures and management activities. All conservation projects would require NEPA review before implementation. Under this alternative, grazing and agricultural practices would not be allowed.

4.1.3 Alternative B Impacts

An active management plan would implement more land management projects than the other plans. It would have the same general goals and objectives, but would cost more in time, manpower, and funding. There would also be the potential for more land-disturbing projects, erosion-control, and associated problems. This alternative has the potential to be more aggressive and could involve more projects that would be considered more preventive than corrective. While the activity level would be higher, no significant adverse impacts would be expected because these projects would be designed to protect and preserve the land; and all conservation projects would require NEPA review before implementation. The use of fire as a management tool would increase under this alternative, with the corresponding potential for increased negative impacts. However, the impacts of fire would not be expected to have negative impacts, because it would be used as part of a management strategy to benefit and enhance natural conditions. More intensive management measures have been considered, but rejected. These involved implementing agricultural outleasing. While agricultural practices have been found to be possible on Edwards AFB, they would be inconsistent with the management guidelines for the desert tortoise and would increase the general level of disturbance of natural vegetation found on the Base.

4.1.4 Alternative C Impacts

General land management issues at Edwards AFB as it relates to natural resource management are minimally managed under current conditions. The following management activities that relate

to land use would continue under the No Action Alternative: wildfire suppression; informal erosion control, including restricted off-road travel; NEPA documentation review by Natural Resources personnel on action projects; and threatened, endangered, and candidate species consideration during the planning and review process; and an Environmental Awareness program. Under this alternative grazing and agricultural practices would not be allowed.

Impacts from natural resource management activities on general land use under the No Action Alternative would be expected to be isolated and of an ephemeral nature. Wildfires are controlled and the use of fire as a management tool is very limited under this alternative, and would not be expected to produce negative impacts. Under this alternative, most natural resource management activities would be in and around specific project sites. The natural resources of the Base would be marginally maintained; however, biodiversity would potentially suffer. Compliance monitoring and preservation activities alone would not typically be expected to sustain an ecosystem on a long-term basis.

4.1.5 Noise (Annoyance)

4.1.5.1 Alternative A Impacts

Increased reliance on nonchemical pest control methods may cause minor, local increases in noise levels during weed management activities. There would also be an expected increase in the type and amount of equipment used in restoration and management projects. Typical engine noise generated by vehicles performing natural resource management activities would be expected to be comparable to that of a tractor or other farm equipment. Noise levels associated with natural resource management activities would not be expected to deviate significantly from present noise levels and could potentially be masked by the existing background noise because natural resource management projects would be expected to be conducted in relatively sparsely populated areas already subjected to several noise sources (e.g., railways, highways, aircraft operations, etc.). Nonchemical pest control activities would not be expected to generate noise that would conflict with Federal, State, or local noise standards or create noise levels incompatible with existing or proposed land use.

4.1.5.2 Alternative B Impacts

A high level of natural resource management activity has the most potential to produce noise impact from expected projects (i.e., exotic species removal, weed removal, restoration projects, and other management practices). Pest management techniques are not likely to substantially increase ambient noise levels for adjoining noise-sensitive areas or generate noise levels greater than 75 dBA (decibel, A-weighted). Due to the remote location of these projects, impacts to humans are not anticipated. Additionally, natural resource management activities are not likely to expose people to noise levels exceeding OSHA standards, provided natural resource management personnel use appropriate hearing protection (as required by Air Force regulations and policies) when operating noisy equipment. Typical engine noise generated by the vehicles performing natural resource management activities would be expected to be comparable to that of a tractor or other farm equipment.

4.1.5.3 Alternative C Impacts

Continuing the current natural resource management practices would not affect the overall noise levels at Edwards AFB. The current localized levels of noise would continue to occur during some natural resource management activities, such as mechanical weed removal and restoration and management projects. There have been no noise complaints related to natural resource management activities at Edwards AFB. Fewer projects would be expected to be accomplished under this alternative and only a limited amount of time, funds, and manpower would be used. While this alternative produces the least amount of noise impacts, it is also the least likely to successfully accomplish the natural resource management goals and objectives. The minor adverse impacts associated with current actions (e.g., exotic species invasion and unreclaimed disturbed areas) would be expected to continue.

4.2 Air Quality

A CAA Conformity determination has been done for all of the alternatives, which assumes all pesticides and herbicides used convert 100 percent into VOCs. Under the preferred alternative, a 10-percent increase in equipment use (vehicles and other equipment) is expected, contributing to increases in NO_x. Under all of the alternatives considered, less than a ton of emissions are expected, which is well below the *de minimis* levels for each pollutant. A CAA Conformity Statement is on file at the Environmental Directorate Office.

4.2.1 Alternative A Impacts

Although a plan to improve air quality is not directly addressed in the INRMP, air quality would be expected to improve slightly in response to the full implementation of the restoration and management programs. The systematic restoration and management program part of the preferred alternative would indirectly reduce the generation of PM10 through the designation of most playas as off limits, the closure of unneeded roads, and the revegetation of damaged areas. This alternative would also reduce PM10 by requiring the reseeding of disturbed areas with native vegetation. This practice increases the likelihood of successful restoration and is consistent with the Presidential Memorandum on Federally Sound Landscaping. Wildfires would be suppressed, and there would be no use of controlled burns.

Under the targeted management plan, the only potential increase to air quality impacts would be the limited use of pesticides from exotic species control (VOCs) and emissions from increased management activities (NO_x). Even when combined with other emissions at the Edwards AFB, these emissions would not be expected to exceed any NAAQS standards.

4.2.2 Alternative B Impacts

Active management of the natural resources on Edwards AFB would include an increase in management intensity. An increase in the active control of exotic species would probably include increased use of pesticides (VOCs) as well as ground-disturbing methods of pest control, manual and mechanical (NO_x). Both have the potential to degrade air quality through increased VOC emissions and increased potential for PM10 due to the prevailing winds. The VOC emissions would not be expected to exceed any NAAQS standards because they would only be used in accordance with the approved policy. The long-term monitoring program would be expected to

monitor any potential land-disturbing actions, and if necessary, to develop restoration projects to control potential soil erosion due to wind.

4.2.3 Alternative C Impacts

The major concerns regarding air quality and potential environmental effects pertain to increases in pollutant emissions; exceedances of NAAQS and other Federal, State, and local limits; and impacts on existing air permits. Historically, there has been an occasional use of pesticides (VOCs), but aerial spraying has not been done, and is not expected to be. Mobile pollution sources associated with natural resource management activities are primarily vehicles and equipment (NO_x) used for surveying and project-specific restoration and management projects. This alternative would allow primarily natural reseeding of historically disturbed areas. Natural reseeding is typically a slow process and has a higher potential to develop "blowout areas" which could degrade air quality (PM10). There would, however, be fewer pesticides used, and therefore, few VOC emissions related to pesticide use under this alternative. Wildfires would continue to be fought, and historically there has been limited use of controlled burns.

Natural wind erosion is probably the largest contributor to air pollution on and around the Base. No effects would be expected under the No Action Alternative, because no changes to current practices would occur. Currently, emissions from the natural resource management activities being used at Edwards AFB are minimal and do not exceed any thresholds that would require an air quality permit. Therefore, there would be no effects regarding air quality as a result of implementing the No Action Alternative.

4.3 Safety and Occupational Health

A major safety concern at Edwards AFB for any ground-disturbing activity is the presence of unexploded ammunition and bombs commonly referred to as UXO. Any natural resource related activity under all of the alternatives considered, that would have ground-disturbing activities associated with it, would follow established safety procedures before implementing the action.

4.3.1 Alternative A Impacts

The preferred alternative would be expected to have more restoration and management projects and exotic species removal projects as compared to the status quo. The potential exists for fuel or oil leaks from the increased use of vehicles and equipment during natural resource management activities, potentially causing some health and safety issues. Edwards AFB maintains an O*il and Hazardous Substance Spill Prevention and Response Plan* (SPRP) (AFFTC 1993a) that outlines procedures for spill response and cleanup, as well as individuals trained to clean up spills. Contractors and military working on Edwards AFB are briefed on spill response and cleanup procedures. Integrated Pest Management (IPM) emphasizes nonchemical measures, but does not rule out the increased use of chemical treatments as part of a pest removal plan. The increased reliance on nonchemical pest management techniques is not expected to create a potential health hazard and any chemical measures used would be performed only under the supervision of a DoD-certified pesticide applicator.

4.3.2 Alternative B Impacts

The active management alternative (i.e., more exotic species removal, and restoration and management projects) has the greatest potential for negative impacts. However, with the safeguards in place (as described in Alternative A) and the fact that almost all of the activities are specifically designed to enhance and improve the existing environmental conditions, no negative impacts would be expected under this alternative.

4.3.3 Alternative C Impacts

Under this alternative there would be limited equipment use for basic surveys and limited restoration projects. There would also be a limited amount of herbicide and pesticide used to treat problem exotic species. Edwards AFB requires equipment and vehicle operators to be trained and qualified before they are allowed to operate any equipment. All herbicides and pesticides are applied under the supervision of a DoD-certified applicator. As in Alternative A, Edwards AFB maintains a SPRP that outlines procedures for spill response and cleanup, as well as individuals trained to clean up spills. Contractors and military working on Edwards AFB would continue to be briefed on spill response and cleanup procedures.

4.4 Hazardous and Solid Waste

4.4.1 Alternative A Impacts

No effects would be expected from hazardous and toxic materials. All hazardous and toxic materials would continue to be handled in accordance with Federal laws and Air Force regulations, including RCRA, FIFRA, and *Toxic Substances Control Act* (TSCA) (15 USC 2601 et seq.). Spills of hazardous materials are always a possibility, however, Edwards AFB maintains a SPRP that outlines procedures for spill response and cleanup, as well as individuals trained to clean up spills. There is also the potential for fuel or oil leaks from vehicles during management activities that could cause contamination. Contractors and military members working on Edwards AFB are briefed on spill response and cleanup procedures. Thus, no adverse effects regarding the generation of hazardous and toxic materials would be expected under the preferred alternative.

4.4.2 Alternative B Impacts

The active management alternative (i.e., more restoration and management and exotic species removal projects) has the greatest potential for negative impacts. However, with the safeguards in place (as described in Alternative A), no negative impacts would be expected under this alternative.

4.4.3 Alternative C Impacts

No effects would be expected from hazardous and toxic materials under current conditions. All hazardous and toxic materials would continue to be handled in accordance with Federal laws and Air Force regulations, including RCRA, FIFRA, and TSCA. Under the No Action Alternative, the Pest Management Coordinator would continue to control pesticide, herbicide, and soil sterilant use on Edwards AFB. Additionally, Edwards AFB would continue its efforts in limiting or decreasing

the amount of toxic materials used consistent with EO 12856. Edwards AFB has spill plans in place and individuals trained to respond to any incident. Personnel who apply pesticides, herbicides, and soil sterilants must hold a DoD Pest Management certification in US EPA Categories 3, 5, 6, 7, and 8, as required by FIFRA. The current level of reliance on chemical pest management techniques is not expected to create a potential hazard, provided that pesticides are used in accordance with approved label instructions. Thus, no adverse effects regarding the generation of hazardous and toxic materials would be expected under the No Action Alternative.

4.5 Biological Resources

All of the natural resource projects proposed under the various alternatives are designed to mimic or enhance the natural processes and would be expected to enhance biological resources in general. There is a high potential for beneficial results from these management activities. The preferred alternative would provide management of faunal and floral resources at Edwards AFB on an integrated basis. The INRMP uses an ecosystem management strategy to achieve biological diversity conservation, in accordance with the DoD Biodiversity Initiative (The Keystone Center 1996). It emphasizes the use of native species for restoration activities, as emphasized on the Presidential Memorandum to the heads of Federal agencies.

The preferred alternative includes specific actions to manage the Mojave Desert ecosystem, including wildlife habitat conservation and enhancement, wildlife population management, cantonment area management, conservation of special interest natural areas, and an integrated approach to pest management. These programs include protection from wildfires, monitoring of a variety of plants and animals, and minimization and repair of damage to habitats from human activities. Under all alternatives considered, the NEPA project screening process would be expected to provide a methodology to ensure compliance with laws and regulations affecting biological resources at Edwards AFB. The preferred alternative also provides a means to use biological resources for a variety of human uses, a major tenant of ecosystem management. These uses include military activities and a variety of outdoor recreational uses, including hunting, nature study, and others.

4.5.1 Vegetation Concerns

4.5.1.1 Alternative A Impacts

The Edwards AFB targeted plan would be expected to be a more systematic approach, as compared to the status quo, to include inventories to identify exotic weeds, including their abundance and location, development of management options, and resources for approved projects to control exotic weeds. The site-specific control plans would be guided by the IPM and revegetation plan, and would emphasize a nonchemical approach, but would consider herbicide use as appropriate. All herbicides used would only be applied by or under the supervision of a trained and certified pesticide applicator. Without intervention, exotic weeds have a long history of becoming established and eventually becoming naturalized. Exotic species frequently do not support the native wildlife as well as the native species and they use mineral resources and space that would otherwise be available for the natural vegetation. The removal of exotic weeds and the use of native seeds in restoration projects would be expected to improve the habitat conditions. Disturbed areas would be identified and monitored as part of the long-term monitoring program.

These disturbed areas would be restored using soil erosion control techniques that include the use of native plants and seeds in order to mimic the natural biodiversity. The vitality of the native vegetation would also benefit from restoration projects by using native seed stocks to enhance the population size and local distribution of native species. The net effect on these management activities would be positive.

4.5.1.2 Alternative B Impacts

The active management plan has the most potential for impacting vegetation. More active levels of management would potentially include increased herbicide use, as well as, increases in mechanical disturbances for pest control and other projects. These disturbances have the potential to remove existing vegetation that could expose soils, thus creating erosion problems. An active level of management for natural resources would not be expected to produce significantly adverse impacts because the intent and design of these projects would be to improve the habitat conditions. The native seed policy would be expected to continue and enhance the development of native vegetation and mimic the natural biodiversity. All pesticides used would only be applied by or under the direct supervision of a trained and certified pesticide applicator. These impacts would not be expected to be significant because of the management policies in place on Edwards AFB and expanded long-term monitoring and restoration programs.

4.5.1.3 Alternative C Impacts

Management of the natural resources at Edwards AFB under the No Action Alternative would be expected to have a minor adverse impact. The current collection of management practices would not be expected to cause significant impacts to floral species on Base, because it involves no change in current activities. The limited active management alternative would include natural resource Best Management Practices (BMPs) in association with specific project areas on a project-by-project basis and in severe problem areas. In areas not directly associated with a project, the vegetation resources would be protected from disturbances, but allowed to develop on their own. The spread of exotic weeds, however, is a recognized problem and exotic species have been recorded on Base as part of the basic inventory work. The status quo alternative has few aggressive measures to remove or prevent the spread of exotic species and compliance monitoring is not designed to determine the effectiveness of management practices. The current reactive approach to vegetation management has allowed several exotic species to become established and more exotics would be expected to become established and degrade the natural biodiversity in the future under this alternative.

4.5.2 Wildlife Concerns

All of the alternatives considered allow passive use of wildlife resources including hiking, biking and wildlife watching. Limited consumptive use is also allowed (hunting and fishing) in designated areas in accordance with CDFG Regulations (CDFG 1990).

4.5.2.1 Alternative A Impacts

The preferred alternative is considered a low-to-moderate intensity plan for managing wildlife resources. Under a lower intensity management approach, fewer steps would be taken to manage wildlife resources and management would more closely resemble the status quo. Under this

alternative, the wildlife species would benefit from most practices. Restoring priority distributed areas (from mission-related activities or natural causes) with native vegetation and seeds would potentially provide an enhanced site for wildlife use. An emphasis on mechanical, cultural, biological, and limited chemical pest management techniques would reduce the overall probability that wildlife species are harmed either directly or indirectly from removal practices and would eliminate exotic weed species that do not support wildlife species as well as native species. Pesticide use would not be expected to impact wildlife because they would be applied by, or under the direction of, a trained and certified pesticide applicator. The use of native plant species that are better adapted to cyclic droughts than exotic species would provide more resources for wildlife species. Under this alternative, the existing guzzlers would be maintained and studied for redesign to make them self-filling and to determine if they could be modified to prevent pest species use.

4.5.2.1 Alternative B Impacts

The active management plan has the most potential for impacting wildlife resources. A more active level of management would potentially include more pesticide use, as well as, more mechanical disturbances for pest control and natural resource management activities. All of these disturbances have the potential to remove existing vegetation that impacts the habitat used by the wildlife species or directly take wildlife species. An active level of management for natural resources would not be expected to produce significantly adverse impacts because the intent and design of these projects would be to improve habitat conditions. All areas disturbed by mechanical activities (either mission related or natural resource related) would be restored using the practices described. Under this alternative, the number of guzzlers would be expanded and designed to make them self-filling. An increased number of guzzlers would enhance wildlife populations especially during periodic droughts.

4.5.2.2 Alternative C Impacts

Limited adverse effects on game and nongame species would be expected to continue under the No Action Alternative. The health and condition of many wildlife populations would be unknown and adaptive management approaches could not be adequately applied. Potential declines in habitat quality and complexity would continue to affect wildlife and biodiversity, particularly for wildlife that use open areas on the installation. The limited active management under the No Action Alternative would include natural resource BMPs (pesticide use and project related restoration sites) in association with specific project areas on a project-by-project basis, and would be expected to have a minor beneficial impact on the wildlife. In areas not directly associated with a project, the wildlife resources would be protected from disturbances, but allowed to develop on their own. Problem invasive exotic species would be controlled, but the control measures would not be as systematic or as targeted. As with the other alternatives, these impacts would not be expected to be significant because of the management policies in place at Edwards AFB, compliance monitoring and limited restoration programs. Under this alternative, guzzlers would be maintained, however, most currently require artificial filling.

4.5.3 Pest Management Concerns

The preferred alternative is considered a low-to-moderate intensity plan for managing pests in the natural areas on Base. Less intensive management measures would more closely resemble

the status quo and would result in a continual increase in problems associated with pests in the natural areas. This approach was rejected due to potential impairment of the military mission (i.e., damage to access roads due to flooding) and reduced biodiversity. More intensive management measures were considered, but rejected, involving the implementation of pest management measures on a larger scale, such as the widespread use of chemical pesticides to eradicate invasive species under Alternative B. This approach was considered counterproductive and was rejected; that is, a substantial increase in pesticide use would be counterproductive to meeting the Air Force goal for a reduction in toxic substance use.

4.5.3.1 Alternative A Impacts

The site-specific impacts of this alternative would vary based on, among other things, the specificity of the pesticide and its persistence in the environment. Generally, the establishment by local policy of 100-foot buffer zones around sensitive areas including sensitive species habitat and relatively pristine habitat should adequately protect these areas. Protected migratory birds should not be controlled without coordination with the appropriate Federal and State officials. All pesticides used are required to be applied by or under the supervision of a trained and certified pesticide applicator. An emphasis on nonchemical pest management techniques would reduce the current level of risk, but not eliminate all risks that target species and would develop resistance to specific pesticides. Additionally, site-specific chemical impacts to nontarget species would also be reduced. These nontarget species may include predators on the target species who help to keep the target species populations in check. Predators may also bioaccumulate pesticides in their systems and pass them on to other predators higher up on the food chain.

Nonchemical controls with limited chemical pest management are not expected to reduce wildlife populations (other than the target species) below self-sustaining levels. Additionally, these methods will not result in the introduction of noxious weeds to an area. Only native seed mixes should be used to limit the introduction of noxious weeds or exotic species. The introduction of exotic species for pest control purposes is a nonchemical means of pest control that could potentially have a local impact on flora and fauna. Only biological materials approved by the United States Department of Agriculture would be considered for use. Any biological control used by Edwards AFB would be coordinated with the appropriate Federal and State officials.

4.5.3.2 Alternative B Impacts

This alternative has the greatest potential to effectively control pests, but an increased reliance on nonchemical pest management techniques with only increased chemical use also has the greatest potential for negative or adverse impacts. Where chemical techniques are recommended, the pesticides recommended would be the least toxic, least persistent pesticides that are expected to be effective for controlling the target organism. Techniques to minimize the amount of pesticides applied should be used whenever possible. Such techniques include using proper equipment, as well as following correct application timing and sequencing procedures. Precautions should be taken to purchase only as much pesticide as would be needed for a season and to minimize the amount of pesticide mixed and applied. All pesticides used would be expected to be applied by or under the supervision of a trained and certified pesticide applicator.

As long as controls are implemented in accordance with Federal, State, and local laws and project use is limited by the use of buffers, there should be no overall adverse impact to the existing flora and fauna except for the targeted pest. There may be minor site-specific impacts to nontarget species that are also impacted by the chosen pest control methods, but these controls are not expected to reduce wildlife populations other than the target species below self-sustaining levels. Additionally, nonchemical control methods should not result in the introduction of noxious weeds to an area. The potential increase in the introduction of exotic species for pest control purposes is a nonchemical means of pest control that could potentially have a major local impact on flora and fauna and would be coordinated with the United States Department of Agriculture and USFWS before a decision is made.

4.5.3.3 Alternative C Impacts

Continuing current pest management techniques would not be expected to reduce wildlife populations other than the target species below self-sustaining levels. All pesticides used would continue to be applied only by or under the supervision of a trained and certified pesticide applicator. There may be limited site-specific impacts to nontarget species that are also impacted by the chosen chemical. These nontarget species may include predators on the target species who help to keep the target species populations in check. Predators may also bioaccumulate pesticides in their systems and pass them on to other predators higher up on the food chain. The site-specific impacts would vary based on, among other things, the specificity of the pesticide and its persistence in the environment. Only native seed mixes should be used to limit the introduction of noxious weeds or exotic species in accordance with local policy. Currently, there is no use of biological materials for pest control purposes. Lastly, these methods should not result in the introduction of noxious weeds to an area.

4.5.4 Migratory Bird Concerns

The discussion of alternatives under protected species applies equally well to Migratory Birds (see discussion of protected species alternatives below).

4.5.5 Protected Species Concerns

4.5.5.1 Alternative A Impacts

Beneficial effects on Federally-listed species and State rare and listed species at Edwards AFB would be expected from implementation of the preferred alternative. Furthermore, these species would be treated with added importance and valued for their contributions to the unique natural heritage of Edwards AFB. The USFWS is a cooperating agency on this proposed action (development of an INRMP) and have found no impacts to any listed species or critical habitat. After a review of the existing data, the USFWS concurs and requires no further consultation unless (1) the identified action is subsequently modified in a manner that causes an effect on a listed species or designated critical habitat; (2) new information reveals the identified action may affect Federally-protected species or designated critical habitat in a manner or to an extent not previously considered; or (3) a new species is listed or a critical habitat is designated under the ESA that may be affected by the identified action. An emphasis on mechanical, cultural, biological and limited chemical pest management techniques would reduce the overall probability that threatened or

endangered species are harmed, either directly or indirectly, by invasive exotic species. All known sensitive species population would be buffered from pesticide application. Any pesticide application within the 100-foot buffer zones would require an additional assessment prior to treatment, and should be coordinated for approval by the agency with jurisdiction by law or special expertise. All pesticides used would only be applied by, or under the supervision of, a trained and certified pesticide applicator.

Disturbed areas would be returned to natural contours and reseeded with native plants. This effort would be more active than historic practices by including limited watering and limited use of fertilizer. Few, if any, natural resource management practices would be expected to cause significant ground disturbances, and areas with sensitive species are identified through the GIS program for special consideration and conservation. Protected species, including migratory birds, would also benefit from the Base's policy of restricting harvesting or taking of natural products and other ground-disturbing activities. While there is a limited potential for a "take" of a listed species incidental to the management activities, it is considered unlikely because of the monitoring program. No reintroductions of expatriated species are planned under this alternative.

4.5.5.2 Alternative B Impacts

This alternative is considered a moderate-to-high intensity plan for managing Federally-listed threatened and endangered species and moderate intensity plan for State-listed species. Since conservation of Federally-listed species is mandated by Federal law, other management alternatives that would have afforded less conservation to such species were not considered. A high level of active management, but one that does not have any absolute restriction has the greatest potential to protect sensitive species. Impacts to rare, threatened, and endangered species would be expected to be beneficial because an increased level of inventorying, monitoring, and possibly managing sensitive species would occur. If rare, threatened, or endangered species were found on any of the test or training sites, they would be actively identified, monitored, and managed to insure their continued success in the area. The net effect on these management activities would be positive.

A high level of active removal of exotic weeds would be used under this alternative and does have the potential to "take" sensitive species if not done carefully, but also has the potential to actively enhance the natural habitats. No adverse impacts would be expected under this alternative because the management practices are specifically designed to enhance the habitat, and these actions would be performed by or under the supervision of trained wildlife biologists using accepted ecosystem management practices. The use of native seeds as part of restoration and management projects would also be expected to improve the conditions in disturbed areas. The reintroductions of expatriated species would be considered under this alternative, but would require a separate environmental analysis.

4.5.5.3 Alternative C Impacts

Minor adverse affects to sensitive listed species would be expected from the spread of existing exotic species and as additional exotic species invade the Base. Impacts from current management practices to Federally-listed species, as well as State rare and listed species not protected under the ESA, would continue. The No Action Alternative does not provide specific measures for the

conservation and management of these species. Implementation of the No Action Alternative would continue to leave these species vulnerable to potential impacts due to habitat degradation. Current natural resource management practices do, however, meet the minimum requirements of the ESA and adequately protect listed species from being "taken" on Edwards AFB. The control of species designated as Federal and State noxious weeds is also currently required and enhances the conservation of threatened and endangered species to a limited extent. The use of pest management techniques as outlined in the integrated pest management guidance would be expected to protect sensitive species in and around specific project sites. No pest management operations should be conducted that have the potential to adversely impact endangered or protected species or their habitats without prior coordination with the USFWS. Limited and minor ground disturbances have, under current practices, been restored and would continue to be restored by controlling soil erosion and planting native plants and using native seeds. Actions for natural resource management under this alternative would be more reactive than proactive and would be anticipated to allow more impacts than the other alternatives. No reintroductions of expatriated species are planned under this alternative.

4.6 Cultural Resources

There are no significant impacts from natural resource management activities expected on cultural resources at any of the known sites under any of the alternatives considered. Cultural resources are monitored as part of the GIS program and all ground-disturbing actions would continue to be coordinated through Edwards AFB's Base Historic Preservation Officer (BHPO) and would not be performed in areas with known sensitive natural or cultural resources. There are no known buildings or sites eligible for the National Register that have the potential to be impacted under any of the alternatives considered.

The consultation process with American Indian Tribes associated with Edwards AFB is ongoing as part of the overall Air Force program. Edwards AFB has also initiated contacts with Tribal governments for this specific proposed action. Copies of the EA and INRMP have been sent directly to the designated points of contact as part of the consultation process. This proposed action has also been coordinated with the California SHPO.

4.6.1 Alternative A Impacts

The proposed development and implementation of the INRMP would be expected to be beneficial to the conservation of cultural resources. Under the preferred alternative, the probability of disturbing potential cultural resource sites should be reduced because of the enhanced integration. The preferred alternative includes steps to protect cultural resource sites from damage during implementation of this alternative. Ground-disturbing natural resource projects in unsurveyed areas must have site-specific surveys prior to implementation. Implementation of the preferred alternative would provide for a more formalized coordination and integration of cultural resource issues into the natural resource management program. The review of projects by the BHPO and the NEPA process are used to ensure conservation of known and potential cultural resources. Development of a systematic restoration and management program, particularly making sites limited access areas and reducing erosion hazards, is a significant benefit of the preferred alternative to archeological resources.

4.6.2 Alternative B Impacts

While this alternative would have a greater potential for impacting cultural resources, it is not expected to have any direct negative effects. The integration of the planning process for all natural resource projects would provide safeguards, and individually they would all have to comply with laws and policies related to cultural resources. Many actions under this alternative are potential undertakings that could require site-specific cultural resource surveys in unsurveyed areas. The specific ground-disturbing projects proposed for unsurveyed areas would determine the number and type of surveys.

4.6.3 Alternative C Impacts

Minor adverse effects on the cultural resources at Edwards AFB would be expected to continue. The primary concern regarding cultural resources pertains to protecting sites within the boundaries (over 301,000 acres) of Edwards AFB. Under the No Action Alternative, there would be no formal plan that integrates cultural resource issues with the natural resource management planning process, thus increasing the potential for disturbance of important cultural resource sites. Any disturbance of such resources, and possible mitigation actions, would continue to be reviewed, as necessary, by the BHPO and the SHPO.

4.7 Geology, Topography, and Soils

4.7.1 Alternative A Impacts

The preferred alternative includes an integrated program for the planning of land use and maintenance and repair of damaged lands. Brief periods of increased soil erosion could occur during maintenance and rehabilitation of damaged sites, but these would be relatively minor compared to systematic erosion control benefits. Soil resources management would be increased from its current low-intensity level to a more active systematic management level under the preferred alternative. Edwards AFB would consider hardening trails that are not closed. Hardening entails laying base material and compacting it to provide a solid and permeable foundation. Rock may then be laid on the base material. This practice creates an all-weather surface that will withstand repeated use and resist erosion. Native stabilizing vegetation would be used on disturbed areas to prevent soil erosion, consistent with the Presidential Memorandum on Federally Sound Landscaping. Exotic species removal and restoration projects would be expected to increase. While these projects have temporary disturbances associated with them, the short-term disturbances are more than offset by the long-term enhancement of the habitat. Natural wildfires may remove the native vegetation and induce some soil erosion. Wildfire suppression would be expected to continue at approximately its current level. The preferred alternative also offers effective conservation and mitigation for damages incurred by soils due to the Air Force mission.

4.7.2 Alternative B Impacts

Edwards AFB's soil resources would benefit from management at a more active level. Performing additional systematic rehabilitation and preventive maintenance projects could prevent soil loss and facilitate the military mission by improving land conditions. More trails could be improved and more restoration and management projects would be expected. Ground disturbances associated with these projects would be expected to be temporary, usually one growing season or

less. Areas denuded for whatever reason would benefit from more active and systematic management, which would allow more attention to be paid to better seeding techniques during the most appropriate seasons. Wildfire suppression would be more aggressively enforced, directly contributing to reduced soil erosion.

4.7.3 Alternative C Impacts

Soil erosion is potentially a major problem at Edwards AFB. It naturally occurs due to wind and rain. Testing and training done at Edwards AFB are also potential sources of erosion problems. The No Action Alternative would be expected to result in limited impacts on soil quality. The soil conditions would continue to benefit from procedures outlined in the IPM and the implementation of temporary erosion control measures after site-specific projects on an as-needed basis provides some conservation. Most project-related ground disturbances would be expected to be of a temporary nature. Soils would also be expected to benefit from the continued implementation of basic surveys and restoration projects. Exotic species control may result in cleared areas with denuded soils that may erode. Some areas would be revegetated with native seed according to current policy, but revegetation can be difficult due to the Base's dry climate. Lastly, wildfire (that can denude large areas and increase the potential for erosion) suppression would continue. Under this alternative, the philosophy for sites not being actively used would be "let nature take its own course" as long as no compliance issues or mission requirements are involved.

Minor adverse effects could be expected under the No Action Alternative because this alternative does not include the implementation of integrated soil resource monitoring and a systematic plan to minimize existing, or to prevent future soil erosion and sedimentation problems on Edwards AFB. Implementation of the No Action Alternative would involve more reactive management to severe problem areas, rather than managing the resource to prevent impacts or to minimize the extent of unavoidable impacts. The 1997 amendments to the *Sikes Act* require maintaining the capability of Edwards AFB to support its military mission. Actions less than the preferred alternative risk noncompliance with this law.

4.8 Socioeconomic Conditions

Under all alternatives considered, there would be no net change in the number of permanent employees working at Edwards AFB and expected actions would be accomplished within the Base's authorized strength levels. From an economic standpoint, there are almost no expected economic changes from the current baseline. While some of the specific projects would be expected to be contracted out and the supplies used would probably be purchased locally, the regional economy would not be significantly affected under any of the alternatives because the proposed plans would not significantly alter money flow in the region. Future population and employment fluctuations in and around the Edwards AFB training sites are likely, but would not substantially influence the Base's management of natural resources due to their limited scope and relative low cost, as compared to the overall Base budget. None of the proposed alternatives would be expected to directly foster economic or population growth, additional housing, remove obstacles to growth, tax community service facilities, or encourage or facilitate other activities that cause significant environmental effects because of their limited size.

4.9 Environmental Justice And Protection Of Children

4.9.1 Alternative A Impacts

Edwards AFB's proposed action would not in itself create any advantage or disadvantage for any group or individual. Edwards AFB is a limited-access Base located in a remote area and has approved spill prevention and spill cleanup plans. Both of these factors limit the possibility of anyone being exposed to adverse conditions. Edwards AFB is also an equal opportunity employer. Developing and implementing an INRMP at Edwards AFB is not expected to cause disproportionately high and adverse health or environmental effects on minority or low-income populations or children. Children and the general public are not likely to come in contact with these areas. The INRMP is designed to benefit natural resources and the overall ecosystem, and harmful effects on either the natural or human environment are not anticipated. Edwards AFB would address, however, any project-specific issues regarding disproportionate adverse health or environmental effects on children, minority, or low-income groups, should they arise, and would use the best environmental management practices to ensure compliance with applicable regulatory requirements.

4.9.2 Alternative B Impacts

This alternative has the greatest potential of adverse impacts due to the general increase in management practices and increased number of projects. The public is not likely, however, to be exposed to physical danger from any activity proposed for natural resource management. As described in Alternative A, Edwards AFB has limited access and is remotely located. Due to these factors, there is almost no exposure risk or possibility of causing disproportionately high and adverse health or environmental effects on minority or low-income populations or children.

4.9.3 Alternative C Impacts

Continuing current natural resource management techniques would not be expected to have an impact on environmental justice issues or cause a disproportionate health or safety risk to children. None of the natural resource management projects currently being performed would be expected to have a disproportionately high or adverse human health or environmental effect on minority or low-income populations or children, because all projects are reviewed by the Environmental Management Directorate, following NEPA guidelines, before they can proceed. Therefore, no significant impacts of any kind are expected.

4.10 Cumulative Impacts

A cumulative impact is defined by CEQ (40 CFR 1508.7) as an impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts overlap impacts of other activities in time and space. Cumulative impacts can result from individually minor but collectively significant actions taking place locally or regionally over a period of time. This type of interaction should be rare because an INRMP by design incorporates existing installation planning documents (i.e., General Plan) and management plans (i.e., *Integrated Pest Management Plan*) and is required to be reviewed annually and updated every 5 years at a minimum. Development and implementation of the INRMP would result in a

comprehensive environmental strategy for Edwards AFB that represents compliance, restoration, prevention, and conservation; improves the existing management approach for natural resources on the installation; and meets legal and policy requirements consistent with natural resources management philosophies. Over time, adoption of the preferred alternative would be expected in order for Edwards AFB to achieve its goals of maintaining ecosystem biodiversity and viability and ensuring sustainability of desired military testing and training area conditions.

The INRMP development involves establishing partnerships with Federal, State, and local groups. These partnerships further reduce the possibility for cumulative effects arising that have not already been considered within the INRMP. By their nature, integrated planning, ecosystem management, and partnering are techniques that reduce cumulative effects. Outside of the actions included in the INRMP, several general actions may result in cumulative effects, for example, major changes in the Base's military mission; major funding or personnel changes; significant changes in local, County, or State planning and development (i.e., changes in land use) of the surrounding areas; and major highway construction. As new, relevant issues or initiatives arise (on or off-Base or within the State, local, or regional community), they would be considered in the INRMP at either the annual review or 5-year update period. Consequently, there is a reduced possibility for cumulative impacts arising that are not already considered in the INRMP. Associated long-term monitoring of study plots and project sites will also contribute to a reduction in negative cumulative impacts through adaptive management.

The AFFTC will remain responsive to the changing conditions and urgent requirements of the 21st Century (AFFTC 2001). Although growth and development can be expected to continue outside Edwards AFB and the surrounding natural areas, the environmental impacts of the development may adversely affect natural resources within the ecoregion. The management activities proposed for Edwards AFB would not be expected to result in cumulative adverse impacts on these resources when added to the impacts of activities associated with the proposed management measures contained in the INRMP. There has been no irretrievable or irreversible commitment of funds or resources associated with this proposal.

The Edwards AFB targeted plan alternative, an active management plan alternative, and the no action with limited active management plan alternative, were examined to determine the potential cumulative impacts that may arise under each of the potential future conditions. The preferred alternative (Alternative A) would not be expected to have significant negative environmental consequences as compared to existing conditions. While there may be short-term minor adverse impacts, the net impact should be generally positive. Alternative B could have a wide range of environmental consequences, ranging from very positive to minor negative impacts on various components of the Edwards AFB environment. The three alternatives (including the No Action Alternative) represent a wide range and differ significantly in their ability to effectively manage natural resources, support the military mission, mitigate environmental damage due to the Air Force mission, and comply with the intent and the letter of all the environmental laws.

4.10.1 Alternative A Impacts

The preferred alternative consisting of management intensities targeted to the specific needs of a given resource category would provide Edwards AFB managers with a reasonable ability to respond to issues that could potentially result in negative cumulative effects. For example the

USFWS states that habitat loss and exotic species invasion are the two most significant factors related to endangered species. This alternative increases the extent of habitat restoration and provides a systematic approach for exotic species removal. The preferred alternative contains sufficient flexibility in its initiatives and monitoring to allow meaningful adaptive management. The increased management efforts for soils, wildlife and habitat resources under the preferred alternative, as well as, the continued integration of the management activities, would place Edwards AFB in a favorable position to respond to and limit negative cumulative effects. Changes in mission, funding, or personnel reductions or changes in off-site land use planning and development could be responded to through adaptive management and could be incorporated into the subsequent update of the INRMP. Updating the INRMP could realign the management intensities to support mission or other changes promoting positive cumulative effects such as refining the native seed mix for enhancing recovery in restoration or soil erosion control projects.

4.10.2 Alternative B Impacts

The increased funding level and personnel support of this alternative would permit Edwards AFB to increase the number of restoration projects, remove more exotic species, and control the impacts to natural and man-made soil erosion issues. All of these actions go to a general improvement of conditions that would be expected to support an enhanced natural biodiversity level. It would also allow the Base to readily respond to major changes in mission or to other factors not currently considered (under no action/status quo) or not included in the preferred alternative. This alternative also has the greatest potential for adverse impacts due to the increased level of activity. Adverse impacts are not expected to occur because all of the activities performed would fit into the plan to enhance the natural resources. This alternative would also encourage additional new partnerships.

4.10.3 Alternative C Impacts

Implementation of the No Action Alternative, which is more reactive compared to the other plan alternatives, would result in no change to the existing minor cumulative impacts. Some of the minor impacts associated with the current management of natural resources at Edwards AFB include the expansion of exotic species currently on Base, the invasion of new exotic species, soil erosion in disturbed areas and a general loss of biodiversity because of these impacts. The No Action Alternative, which continues natural resources management at the status quo, would not be able to respond effectively to significant changes in the military mission, significant funding cuts, or major changes in off-Base planning and development that interact with installation resources. The reactive approach to the management of soil resources could result in cumulative effects due to erosion. In the absence of long-term monitoring and with limited partnerships, natural resource managers may be unaware of actions that could potentially adversely impact either their ability to implement natural resources initiatives or successfully conclude initiatives. Conversely, potentially beneficial cumulative effects may go unnoticed, and therefore be underutilized. This plan alternative is compliance driven. This limits the ability of Edwards AFB staff to manage natural resources beyond basic requirements. Edwards AFB's ability to develop new partnerships unrelated to compliance issues and to respond to changes in land-use requirements would also be limited under this alternative.

4.11 Findings and Conclusions

Edwards AFB should implement the preferred alternative as the INRMP to manage natural resources, support the military mission, mitigate environmental effects of the overall military mission, and comply with various environmental laws. While none of the alternatives were found to have significant impacts as defined by CEQ, full implementation of the preferred alternative would ensure the continued use of Edwards AFB natural resources for the military mission and outdoor recreational uses. The preferred alternative plan also meets the goal of having a management plan with as little as possible interference from man.

The preferred alternative is considered a low-to-moderate intensity plan for managing natural resources. Less active management measures would more closely resemble the status quo. This approach was rejected due to potential impairment of the military mission and the natural decay of certain resources due to man-induced factors (i.e., exotic species would continue to invade and spread). More intensive and active management measures were also considered, but rejected. Many aspects of this alternative involve implementing habitat management measures on a larger scale or intensity with some limited unique activities not found in the other alternatives. However, a more gradual adaptive management approach that allows stakeholders at the installation to collectively guide the overall goals for habitat management is believed to be a better approach, especially due to the many uncertainties associated with large-scale natural resource management.

Implementing the preferred alternative would not be expected to result in significant detrimental impacts to environmental systems or have impacts that would cross any international borders. Minor adverse impacts on wildlife habitat would be mitigated by full implementation of restorative and aggressive wildlife management provisions in the INRMP. There is a high likelihood of beneficial consequences associated with the preferred alternative, such as reducing negative impacts to soil, air, and biological resources, thereby avoiding violations of Federal and State laws, including the *Sikes Act,* ESA, and CAA. Implementation of the preferred alternative would also allow the Air Force to manage its natural resources at Edwards AFB in an enhanced manner to meet current and future conservation needs. Implementing the preferred alternative would not constitute a major Federal action significantly affecting the quality of the environment. A FONSI is fully supported by this analysis.

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16 USC 470 et seq., *National Historic Preservation Act.*
16 USC 661-667e, *Fish and Wildlife Coordination Act.*
16 USC 668-668d, *Bald Eagle Protection Act.*
16 USC 670a-670o, *Sikes Act.*
16 USC 703-712, *Migratory Bird Treaty Act.*
16 USC 1531-1544, *Endangered Species Act of 1973.*

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7.0 LIST OF AGENCIES AND ORGANIZATIONS TO WHOM COPIES OF THE ENVIRONMENTAL ASSESSMENT ARE SENT

Federal Agencies

Bureau of Land Management, Barstow, California

Edwards Base Library, 95 SPTG/SVRL, Edwards AFB, California

Environmental Protection Agency, Region IX, San Francisco, California

Headquarters, AFMC/CEV, Wright Patterson AFB, Ohio

US Department of the Interior, Fish and Wildlife Service, Ventura, California

State Agencies

California State Clearinghouse, Sacramento, California

California Department of Fish and Game, Fresno and San Diego, California

City of Lancaster Planning Department, Lancaster, California

City of Palmdale Planning Department, Palmdale, California

Kern County Air Pollution Control District, Bakersfield, California

Kern County Library, Beale Memorial Branch, Bakersfield, California

Kern County Library, Boron Branch, Boron, California

Kern County Library, California City Branch, California City, California

Kern County Library, Mojave Branch, Mojave California

Kern County Library, Wanda Kirk Branch, Rosamond

Los Angeles County Library, Lancaster Branch, Lancaster, California

Los Angeles County Planning, Los Angeles, California

Native American Heritage Commission, Sacramento, California

Palmdale City Library, Palmdale, California

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APPENDIX A
ENVIRONMENTAL JUSTICE

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ENVIRONMENTAL JUSTICE CONCERNS AT EDWARDS AFB

Introduction

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* issued on 11 February 1994, requires Federal agencies to identify and address disproportionately high and adverse human health effects of its activities on minority and low-income populations. The following discussion identifies the region of influence (ROI) to be used for the evaluation, analyzes the ROI and the Edwards AFB regional population for racial and socioeconomic characteristics, and evaluates the potential environmental and human health impact(s) that Edwards AFB activities may have on these groups.

The ROI for Edwards AFB is the area within which most of an activity's impact to the social and economic features of the current urban environment would occur. One method for determining this impact region is to analyze areas within a 50-mile radius (80.5-kilometer) of the Main Base area at Edwards AFB. Communities within the 50-mile radius of Edwards AFB will comprise the ROI for Edwards AFB and will be used to assess disproportionately high environmental and human health impacts associated with Edwards AFB activities on minority and/or low-income populations. Thus, the majority of potential impacts from Edwards AFB activities would occur within the Antelope Valley area. Figure A-1 provides boundary information for Edwards AFB and the Edwards AFB ROI.

Minority Populations

A minority population is defined using the following criteria (1) a community experiencing common conditions of environmental exposure or effect for which the minority population percentage is greater than the minority population percentage in the appropriate unit of geographic analysis; or (2) a group of minority people in the appropriate unit of geographic analysis which are in excess of 50 percent.

Minority populations include individual(s) classified by the Office of Management and Budget Directive Number 15 as Black/African American, Hispanic, Asian and Pacific Islander, American Indian, Eskimo, Aleutian, and other non-White persons. The 1990 Census categories for race include: White; Black; American Indian, Eskimo, or Aleutians; Asian or Pacific Islander; and other race. In addition, Hispanic is a category of ethnic background, which will also be considered.

Table A-1 provides information on population and population percentages by race for Kern, Los Angeles, and San Bernardino Counties. Table A-2 provides information on population and population percentages by race for the Edwards AFB ROI by county.

The percentages of Blacks, Asian or Pacific Islanders, and other racial groups were found to be lower in the Edwards AFB ROI per county than in Kern, Los Angeles, and San Bernardino Counties. The percentages of Blacks were found to be lower within the Edwards AFB ROI (per county) than in Kern (2.5% to 5.5%), Los Angeles (7.1% to 11.2%), and San Bernardino (3.5% to 8.1%) Counties. The percentages of Asian or Pacific Islanders were found to be lower within the Edwards AFB ROI (per county) than in Kern (0.6% to 3.0%), Los Angeles (0.9% to 10.8%),

and San Bernardino (1.5% to 4.1%) Counties. The percentages of other racial groups were found to be lower within the Edwards AFB ROI (per county) than in Kern (3.4% to 20.3%), Los Angeles (13.3% to 20.6%), and San Bernardino (3.2% to 13.7%) Counties.

The percentages of Whites and American Indians, Eskimos, or Aleutians were found to be greater within the Edwards AFB ROI per county than in Kern, Los Angeles, and San Bernardino Counties. The percentage of Whites was found to be greater within the Edwards AFB ROI (per county) than in Kern (90.9% to 69.8%), Los Angeles (76.8% to 56.9%), and San Bernardino (90.3% to 73.1%) Counties. The percentages (per county) of American Indians, Eskimos, or Aleutians within the Edwards AFB ROI are slightly greater (less than one percent) than those reported in Kern and San Bernardino Counties. The percentages of American Indians, Eskimos, or Aleutians were found to be greater within the Edwards AFB ROI per county than in Kern (2.6% to 1.3%), Los Angeles (2.0% to 0.5%), and San Bernardino (1.5% to 1.0%) Counties.

Hispanic is an ethnic group category to be differentiated from a racial group. Members of any racial group may be of Hispanic origin or ethnic background. For example, one could have a racial group categorization as an Asian or Pacific Islander and an ethnic group classification as a Hispanic.

Table A-3 provides information on the 1990 Hispanic population by racial group for Kern, Los Angeles, and San Bernardino Counties. Table A-4 provides information on the 1990 Hispanic population by racial group for the Edwards AFB ROI by county.

The percentages of Hispanics were found to be lower within the Edwards AFB ROI (per county) than in Kern (3.4% to 20.3%), Los Angeles (13.3% to 20.6%), and San Bernardino (3.2% to 13.7%) Counties.

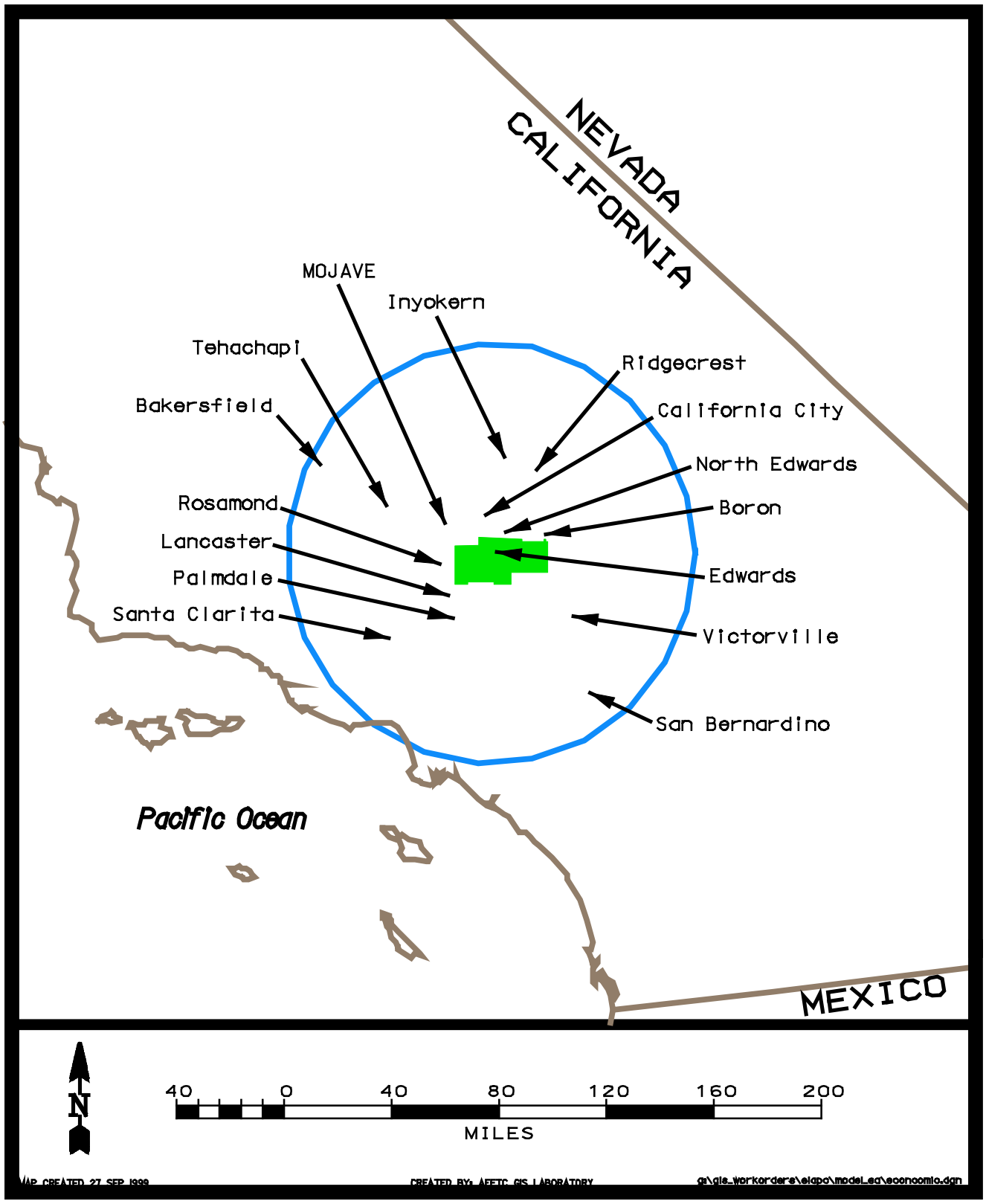

Figure A-1. Edwards Air Force Base Region of Influence

TABLE A-1
1990 POPULATION AND POPULATION PERCENTAGES BY RACE FOR KERN, LOS ANGELES, AND SAN BERNARDINO COUNTIES

	Kern County		Los Angeles County		San Bernardino County		TOTALS	
Racial Group	**Population**	**Percent**	**Population**	**Percent**	**Population**	**Percent**	**Population**	**Percent**
White	379,583	69.8%	5,044,718	56.9%	1,036,394	73.1%	6,460,695	59.7%
Black	26,679	5.5%	990,406	11.2%	115,302	8.1%	1,135,387	10.5%
American Indian, Eskimo, or Aleutian	7,239	1.3%	43,689	0.5%	14,271	1.0%	65,199	0.6%
Asian or Pacific Islander	16,390	3.0%	955,329	10.8%	58,676	4.1%	1,030,395	9.5%
Other Race	110,586	20.3%	1,829,022	20.6%	193,737	13.7%	2,133,345	19.7%
TOTALS	543,477	99.9%	8,863,164	100.0%	1,418,380	100.0%	10,825,021	100.0%

Source: Bureau of the Census, 1992
Note: Percentages may not equal 100% due to rounding.

TABLE A-2
1990 POPULATION AND PERCENTAGES BY RACE FOR THE EDWARDS AFB REGION OF INFLUENCE BY COUNTY

	Kern County		Los Angeles County		San Bernardino County		TOTALS	
Racial Group	**Population**	**Percent**	**Population**	**Percent**	**Population**	**Percent**	**Population**	**Percent**
White	2,881	90.9%	10,902	76.8%	4,940	90.3%	18,723	82.0%
Black	80	2.5%	1,003	7.1%	190	3.5%	1,273	5.6%
American Indian, Eskimo, or Aleutian	82	2.6%	288	2.0%	84	1.5%	454	2.0%
Asian or Pacific Islander	19	0.6%	128	0.9%	83	1.5%	230	1.0%
Other Race	107	3.4%	1,883	13.3%	175	3.2%	2,165	9.5%
TOTALS	3,169	100.0%	14,204	100.1%	5,472	100.0%	22,845	100.1%

Source: Bureau of the Census, 1992
Note: Percentages may not equal 100% due to rounding.

TABLE A-3
1990 HISPANIC POPULATION BY RACIAL GROUP FOR KERN, LOS ANGELES, AND SAN BERNARDINO COUNTIES

Racial Group	Kern County	Los Angeles County	San Bernardino County	Totals
White	37,283	1,409,996	171,564	1,618,843
Black	752	43,544	4,950	49,246
American Indian, Eskimo, or Aleutian	1,178	13,524	3,434	18,136
Asian or Pacific Islander	1,824	31,038	2,966	35,828
Other Race	109,521	1,808,014	190,718	2,108,253
Hispanic Total	150,558	3,306,116	373,632	3,830,306
Population Total	543,507	8,863,164	1,418,380	10,825,021
Percentage of Hispanics	27.7%	37.3%	26.3%	35.3%

Source: Bureau of the Census, 1992

TABLE A-4
1990 HISPANIC POPULATION BY RACIAL GROUP FOR THE EDWARDS AFB REGION OF INFLUENCE BY COUNTY

Racial Group	Kern County	Los Angeles County	San Bernardino County	Totals
White	160	1,236	480	1,876
Black	0	104	12	116
American Indian, Eskimo, or Aleutian	9	32	8	49
Asian or Pacific Islander	0	0	0	0
Other Race	107	1,859	175	2,141
Hispanic Total	276	3,231	675	4,182
Population Total	3,169	14,204	5,472	22,845
Percentage of Hispanics	8.7%	22.6%	12.3%	18.3%

Source: Bureau of the Census, 1992

Low-Income Populations

A low-income population may be defined as (1) a community or group of people experiencing common conditions of environmental exposure for which the Median Household Income is equal to or less than 50 percent of the Median Household Income for the jurisdiction or other appropriate units of geographic analysis or (2) meet the Department of Health and Human Services poverty guidelines. An example of criteria (1) a household earning $22,000 would be considered low income if the Median Household Income within the unit of geographic analysis is $44,000. Using criteria (2), a family of four earning $14,800 or less would be considered to be living in poverty regardless of the Median Household Income for the area.

Table A-5 provides information on the 1989 Median Household Incomes for Kern, Los Angeles, and San Bernardino Counties and the Edwards AFB ROI. The 1989 Median Household Incomes within the Edwards AFB ROI are greater than those for Kern ($32,453 to $28,634) and Los Angeles ($37,287 to $34,964) Counties. The 1989 Median Household Income within the Edwards AFB ROI portion of San Bernardino County ($32,514 per year) was found to be $929 per year less than that reported in San Bernardino County ($33,433 per year). Therefore, no low-income communities have been identified within the Edwards AFB ROI under low-income population criteria (1) or (2).

TABLE A-5
1989 MEDIAN HOUSEHOLD INCOMES FOR KERN, LOS ANGELES, AND SAN BERNARDINO COUNTIES AND THE EDWARDS AFB REGION OF INFLUENCE

1989 Median Incomes	Kern County	Los Angeles County	San Bernardino County
1989 Median Incomes by County	$28,634	$34,964	$33,443
1989 Median Incomes for the Edwards AFB Region of Influence by County	$32,453	$37,287	$32,514

Source: Bureau of the Census, 1992

Conclusion

Based on an analysis of the information provided in this document, it is concluded that Edwards AFB activities associated with natural resource management are not anticipated to have any disproportionately adverse environmental or human health effects on minority or low-income populations.

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APPENDIX B
AIR CONFORMITY LETTER

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HEADQUARTERS AIR FORCE FLIGHT TEST CENTER (AFMC)
EDWARDS AIR FORCE BASE, CALIFORNIA

MEMORANDUM FOR AFFTC/CV

FROM: AFFTC/EM
5 East Popson Avenue, Building 2650A
Edwards AFB CA 93524-1130

SUBJECT: Clean Air Act Conformity Statement for Integrated Natural Resources Management at Edwards Air Force Base

1. The following finding is made on the need for a conformity statement under the *Clean Air Act* with respect to the Proposed Action.

a. The Proposed Action is located in the Kern County Air Pollution Control District (KCAPCD).

b. Under regulations promulgated pursuant to the *Clean Air Act*, Title 42 United States Code (USC) Part 7506 (c), the portion of the project area regulated by the KCAPCD is located in a *Serious* nonattainment area for ozone. The *de minimis* level set for this area for emissions of ozone precursor pollutants (volatile organic compounds [VOC] or oxides of nitrogen [NO_x]), in accordance with Title 40 Code of Federal Regulation (CFR) Part 51.853/93.153 (b)(1) and KCAPCD Rule 210.7, is up to 50 tons per pollutant (VOC or NO_x) per year per action.

c. For the KCAPCD, the 1990 regional planning baseline emission inventories for ozone precursor pollutants are included in the 1994 California Ozone State Implementation Plan. The baseline planning values for KCAPCD are 14,965 tons per year (tpy) and 6,205 of NO_x and VOC, respectively. In accordance with 40 CFR 93.153, the 10-percent threshold values for determination of regional significance for KCAPCD are 1,496.5 and 620.5 tpy of NO_x and VOC, respectively.

d. It has been determined that the relevant air emissions for this action are less than one ton for both NO_x and VOC per year. The direct and indirect emissions, when totaled, are less than the *de minimis* amounts specified in Title 40 CFR 51.853/93.153 (b)(1), and are less than the 10 percent threshold values for determination of regional significance; therefore, a conformity determination is not required.

2. Should you have any questions with respect to this finding, please direct them to Jocelyn Swain at (661) 277-9165.

GERALD CALLAHAN
Chief, Environmental Quality Division

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APPENDIX C
AIR EMISSION SOURCES

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AIR EMISSION SOURCES AT EDWARDS AFB

Vehicle and equipment operation and the use of pesticides are the two sources of VOCs identified with the proposed actions associated with natural resource management at Edwards AFB. The operation of motor vehicles and equipment is considered a significant source of ozone precursors. The combustion of petroleum products result in the emissions of VOCs, and a much smaller amount of non-reactive organic compounds, the sum of which is commonly referred to as total organic gases. Emission factors for the operation of motor vehicles have been developed for total organic gases. As a conservative approach, all of the calculated total organic gases emissions will be assumed to be VOCs. For the purpose of this study, emissions of VOCs and NO_x were quantified for the increased operation of both privately owned and Government owned vehicles and weed removal equipment. Similarly, calculations for pesticide VOCs assumed that the total volume used became VOCs.

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APPENDIX D
EDWARDS AIR FORCE BASE LAND USE DESIGNATIONS

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TABLE D-1
EDWARDS AIR FORCE BASE LAND USE DESIGNATIONS

Land Use Designation	Developed Area (acres)	Area Installation (acres)	Percentage of Base
Aircraft Clearance and Explosive Clear Zones	2,697	3,110	1.04
Aircraft Pavements	582	582	0.19
Lakebed Painted Runways	10	1,997	.66
Lakebed Nonmaintained Landing Site	0	39,040	12.98
Aircraft Operations and Maintenance/Engineering Test	1,598	17,811	5.93
Aircraft Test Ranges	913	215,186	71.54
Industrial	2,451	7,795	2.59
Administrative	73	122	0.04
Community Commercial	129	134	0.04
Community Service	185	192	0.06
Medical	45	45	0.01
Housing	973	973	0.31
Outdoor Recreation	1,532	2,451	0.82
Buffer Zone	7,130	11,360	3.78
Jurisdictional Waters	0	0	0
Total	18,318	300,798	100.00

Source: Edwards Air Force Base Comprehensive Plan (AFFTC 1994b)

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